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ABSTRACT

This document consists of 12 issues of the EDUTECH Report. 1998. The newsletter's purpose is to alert faculty and administrators to issues in educational technology. Each issue contains two feature articles, a page of news briefs, a preview of the upcoming issue, and a question and answer column. Most issues also contain brief quotations on education technology topics. The following cover articles appeared between April 1997-March 1998: (1) "Can IT Groups Be Trusted To Teach Computing?" (Howard Strauss); (2) "Leadership in the New IT Organization" (James I. Penrod); (3) "PMS: Project Management Syndrome" (Howard Strauss); (4) "Selecting a New Information System: Basic Principles"; (5) "Gary, That Wasn't a Machine That Beat You" (Howard Strauss); (6) "Hot Issues 1997-98" (Thomas Warger); (7) "Troubled Times for Many IT Departments"; (8) "Determining the Real Cost of an AIS" (part one of a two-part series); (9) "Determining the Real Cost of an AIS" (part two); (10) "Treat E-Mail as Part of Your Campus Information System"; (11) "In Search of Leadership; A Tale of Three Visions" (Howard Strauss); and (12) "The Staff Crisis" (Barbara Horgan). (SWC)

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The Edutech Report
Volume 13, Nos. 1-12
April 1997-March 1998

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THE EDUTECH REPORT

April 1997

Volume 13
Number 1

The Education Technology Newsletter for Faculty and Administrators

Can IT Groups Be Trusted To Teach Computing?

Howard Strauss, Princeton University

Many years ago, university computer centers taught minicourses and seminars to a growing horde of wannabe computer users anxious to enter the modern world of punched cards and mainframes. These courses were taught by the computer center staff and anyone else who could be corralled into speaking to a group about computers. Typical topics covered were text processing, programming, dealing with the operating systems, and solving problems in the sciences.

Today there has been a total change in computer technology, but by and large, the minicourses and seminars are taught the same way they were decades ago. Even the topics are nearly the same. And the results are pretty much the same as they have always been too—mediocre at best. IT groups often boast about the number of courses they teach and the number of people who attend them. They even look at some complimentary course evaluations and conclude that they are doing a great job. But despite the fact that these courses are taught at universities where one might expect excellent pedagogy, the courses rarely meet the needs of the users that IT groups are trying to reach.

Ask The Oracle

We start doing a bad job in teaching courses by teaching the wrong courses. Once the wrong courses are chosen, the skill of our instructors, the technology of our teaching labs, the dazzle of our presentations, and the soundness of our instructional techniques matter very little.

How are the courses that are taught typically chosen? A quick survey revealed two basic heuristics that are often used together.

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"One important lesson for all of us to consider is the role technology and distance education play in an institution's effort to become more attuned to its constituents. Historically, off-campus students have often been treated differently by faculty and campus offices and thought of not as our students but as continuing-education students. As we reach out via distance education to attract more non-traditional and place-bound students, we need to think of them as our students."

R. Sedlack, G.P. Cartwright
"Two Approaches to Distance Education: Lessons Learned"
Change
January/February 1997

NEWSBRIEFS

RESOURCE FOR WEB-BASED INSTRUCTION

Web-Based Instruction, edited by Badrul H. Khan of the University of Texas at Brownsville, covers all significant aspects of the design, development, delivery, and evaluation of instruction using the World Wide Web. In 59 chapters, this 480-page-volume provides users of the Web with on-line sources, case studies, references, and other forms of information regarding ways to use this new technology to improve opportunities for learning at all levels. Nearly one hundred authors, representing institutions situated throughout the world, participated in the writing of this timely volume—using the Web to coordinate their efforts, thus assuring a complete treatment of this important topic. E-mail and Web addresses are given for all chapter authors, most of whom have active Web sites that can provide additional information to readers of the book.

For more information or to order, contact Educational Technology Publications, 700 Palisade Avenue, Englewood Cliffs, New Jersey 07632-0564; 1-800-952-BOOK. The table of contents is available at http://www.utb.edu/~khanb/tc.txt.

EXPLORE THE FUTURE AT CUMREC97

This year's CUMREC (College and University Computer Users Association) conference, scheduled for May 11–14 at Saint Louis University, builds on a long and successful history of providing professional development for those who use and support information systems in higher education. This annual conference provides a forum for the exchange of strategic visions, practical solutions and systems expertise. This year's program is filled with "how-to" approaches, timely topics, and discussion opportunities to help improve the systems that support the needs of your institution. Saint Louis University, this year's host, promises to continue in the proud tradition of information sharing begun in 1956 by Frank Martin of Michigan State University.

For more information, contact John Goerke, Director of Information Systems, Saint Louis University, P.O. Box 56907, St. Louis, Missouri 63156-0907; (314) 977-3061; goerkejm@slu.edu.

TLTR SUMMER INSTITUTE

The American Association for Higher Education (AAHE), Teaching, Learning, and Technology Roundtable (TLTR) has announced its third annual summer institute, "Visions, paths, and support," to be held July 12–15 at the Pointe Hilton on South Mountain, Arizona. The TLTR Program provides services and materials to help colleges and universities improve teaching and learning through more thoughtful and cost-effective uses of information technology. A local TLT Roundtable is a forum for planning, communication, and collaboration—with a primary focus on teaching and learning and a secondary focus on technology.

For more information about the Summer Institute, contact Amanda Antico, Program Associate, TLTR/AAHE, One Dupont Circle, Suite 360, Washington DC 20036; (202) 293-6440 ext. 38; antico@clark.net.

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Can IT Groups Be Trusted To Teach Computing?...

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The budget model: Do what we did last year and tweak it a little; and the supply/demand model: Find out what people are willing to teach and go with it. One rule that I never heard, except from disgruntled users (at other universities, of course) was to ask your users what courses they wanted you to teach.

We don't ask our university students what courses they want us to teach so why should we treat IT users any differently? Sure, students might petition for some special courses or even occupy the administration building to make their point a bit stronger, but our faculty teaches topics that they are most enamored with and that they know their students ought to know. In many respects, IT groups treat the service courses they teach like the academic courses offered by the university. But there are very few similarities between the academic needs of our students and our users' need to get their work done with our computers.

With rapidly changing technology, we can't teach the same thing year after year. And our users' level of experience is changing as rapidly as information technology itself. Incoming freshmen often have used computers for four or more years. Staff members often have computers at home. And everyone uses electronic card catalogs, ATM machines, and TVS and VCRs that use menus and cursor control keys. Your "Introduction to Computers" course is more likely to cure insomnia than computer illiteracy.

Of course your users know this. They also know that the needs of graduate students, undergrads, faculty, and staff are quite different. But all of these constituencies want courses that tell them how to get their work done, not the theory of computing. They also want to know how to do specific tasks, not to learn every feature of some software package. After a trying hour of a course on a spreadsheet package in which hundreds of features were explained in detail, a user complained to me about not having learned how to do his departmental budget. "But you learned all about formulas, formatting, copying and sharing files, and lots more than you'd ever need to do your simple budget," I protested. "Oh sure," he said, "I can calculate trigonometric functions, deal with relative and absolute cell addresses, and in theory make those spreadsheets dance and sing, but I don't know how to apply that to the simple things I need to do in my office every day."

Everyone uses electronic card catalogs, ATM machines, and TVS and VCRs that use menus and cursor control keys. Your "Introduction to Computers" course is more likely to cure insomnia than computer illiteracy.

Some universities teach separate courses to faculty, staff, and students in the mistaken belief that these groups are ashamed to be seen stumbling around (that is, learning something new) in front of the other groups. So they teach the same courses to these groups at the same time. That totally misses the mark. There should be separate courses for each of these groups (and for sub-groups within these groups) because their needs are different, not because you don't want them to interact. That means really different courses, not just different times for the same courses.

Teaching adults is very different from teaching children. Adults know what they want to do and what they need to learn. Adults will neither appreciate learning how to include clip-art sharks in their text processing documents nor will they decide that since the teacher covered it, it must be important—unless, of course it is something they really need to do.

The adults we teach are often experts in some field, though not usually *Microsoft Office 97*. They should not be treated like third graders. They can handle the big picture, correct terminology, real world examples (instead of cutesy examples suitable for toddlers), and printed and on-line supporting information that assumes they can read at the high school level.

Adults can contribute to the learning process. They are worldly, have probably seen computers before, and are resourceful (e.g., they know how to use the library). They can bring real examples to class, can engage in lively, thoughtful discussions, and can often stump the teacher. Encourage them to do these things. All students (and the instructor) will benefit.

Adults will apply what they learn immediately in practical ways, if your course enables them to do so. I once saw a third grade history

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Howard Strauss is Manager of Advanced Applications at Princeton University and a frequent contributor to this newsletter.

The Symbiosis of IT and Ins

Information technology both influences and is influenced by strategic planning. To do one without the other is to risk doing each of them badly.

Information technology is not a peripheral activity. It is not an adjunct to our institutions. It is not something that can be thought about—or even worse—funded in peaks every once in a while, then forgotten about the rest of the time. IT is a strategic resource of the institution, and pervades every conceivable activity of the institution, if not at this moment, certainly in the near future.

Virtually every one of a college or university's goals and objectives can be affected in positive ways by information technology. Whether it is using computers and networking to strengthen current and new educational programs, to provide individualized learning experiences for students, to attract and retain students best able to benefit from the college's educational experience, to enhance the quality of student life, or to emphasize sound planning and increased financial strength, information technology has an important, substantive role to play.

While it's true that more and more campus strategic plans have a prominent section on IT, it is also true that many people on campus continue to struggle with what the important strategic IT issues are.

Strategic IT issues

The first big one is, of course, where will the money for information technology come from? (How can we replace hardware as often as it needs to be replaced? How can we ever have enough staff to meet the demand? What do we do about wiring the dorms? What about the faculty who want electronic classrooms?) Most institutions are not receiving increases in public money, and grants are harder than ever to find, so are we saying we just need to bite the bullet and re-allocate existing institutional funds? What about a student technology fee? Or requiring the students to bring their own computers with them so we don't have to maintain as many labs? Are there other usage fees we could put in place?

While it's true that more and more campus strategic plans have a prominent section on IT, it is also true that many people on campus continue to struggle with what the important strategic IT issues are.

The overriding question here is: how well does information technology compete with all the other demands for institutional resources? In this climate of accountability, IT services and resources are at a disadvantage in having to compete with campus priorities whose benefits may be more immediate or more obvious.

After money, there are two big governance questions: whether to have a Chief Information Officer and what the committee structure for IT should look like.

Many institutions today are struggling with the issue of Chief Information Officer (CIO). Whether the institution needs one (How is this different from a director of computing?); whether it should be a new position or a reconfiguration of an existing, or more than one, existing position (Can we afford the political cost of creating a new position, especially a new administrative position, especially a high-level administrative position?); what constitutes the qualifications (Should we require a Ph.D.? Does the person need to have higher ed experience?); who it should report to (Should it report to the president? The provost? The financial vice president? Is it a full vice presidency or is it at a lower level?); what duties should it encompass (Does this mean we're bringing together administrative and academic computing? Should we include the library?); how will this affect the existing IT staff (Is it a slap in the face for the IT department, or will they be relieved that at last there will be some real high-level leadership in this area?); is there an internal candidate (What about the current director or directors?); how difficult will it be to attract the right person to our institution (How high a salary will be required? Is this really as much of a seller's market as we've heard? How do we position ourselves to get the right pool of candidates?); and, of course, the well-known chiefs/Indians issue invariably brought up by the faculty (What we *really* need is more help on the front lines, especially assisting faculty, not another overpaid bureaucratic administrator).

The second governance issue is how many and what kinds of committees to have. What is the difference between a policy committee and an advisory committee? Between an advisory committee and a users' group? Does the committee

structure depend on how the IT service organization itself is organized? How do we keep high-level folks interested in committee work? Do we already have too many committees? Who should chair these committees?

Another major strategic issue is how to get the faculty "on board." The early adopters are there, but what about the mainstream faculty? How do we light a fire, recognizing that very little research has been done yet on educational effectiveness, recognizing that it takes a great deal of time commitment and a willingness to take risks on the part of a faculty member to do this at all, and by the way, recognizing that we probably don't have the right support in the institution to help with instructional design issues, never mind the little things like getting the workstation set up in the classroom in time for class. And then there are the promotion and tenure issues, which still in most institutions, do not recognize or reward faculty for getting involved in technology activities, and at worst, regard these activities as serious distractions from "real academic work."

On the other side of the institution, a major issue is the nature of the information architecture, or, said another way, what is an administrative information system for? One of the things we're seeing now is a headlong rush to acquire new systems, mostly driven by the inadequacy of data access in whatever current system the institution is using, but also driven by such things as worry over the Year 2000 problem. And, just as in the other strategic IT issues, there are many questions surrounding this one that have the potential for major institutional impact. Security and privacy of data, for example. While this has always been important, technology makes it imperative that actual policies be worked out at an institutional level that deal appropriately with this. What about the impact of an information system on student service? Can a good system have a role in student recruitment and retention, the twin foci of enrollment management? And what about the faculty? Do they care about an administrative system? Should they? A good one is typically so expensive that the faculty had better have some involvement here; many institutions are beginning to realize that even the term "administrative information system" is a bad one and that it should be called "campus information system" because there is real potential benefit for everyone, including the faculty. And then once you've got all that settled, you need to face the build-or-buy decision, and if you choose to buy, as many institutions do, it's not over yet—now you have to deal with whether to get a single, integrated system or go the "best of breed" route, selecting the best solutions for different offices and tying them together in some magical way. Even the way the institution goes about making these decisions can be—or should be—strategic. That is, the selection of vendor or of system should not be a computer center decision, nor is it the purview only of the financial vice president, as has been the case at many colleges in the past. Again, we're talking here about something that has major institutional impact, so the process of determining the right solution should be equally inclusive from an institutional point of view.

These are not technology issues; nor should they be dealt with in an ad hoc, reactive way. They are issues of direction and identity for the institution itself.

There are other issues as well, such as universal connectivity (not only how much it costs to provide and support, but what it implies about the changing nature of the educational experience); the need to put together a campus-wide IT training strategy that takes into account individual differences in experience, motivation, and time constraints; and the "service level crisis" and its associated fallout that so many of our campuses are experiencing today.

These issues are not dealt with easily, but more importantly, because they are so significant and the answers have so much potential impact on the institution as a whole, they absolutely have to be part of an institution-wide strategic planning process. These are not technology issues; nor should they be dealt with in an ad hoc, reactive way. They are issues of direction and identity for the institution itself and, despite the fact that many times, a college will feel it is alone in its struggle (one of the most frequent queries consultants hear is, "Is anyone else having this much trouble? Are we the only ones with all these problems? Bet you haven't seen anything this bad, have you?), these issues are pervasive throughout higher education. It's everyone's struggle. ■

Can IT Groups Be Trusted To Teach Computing?...

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paper that had a grade of A but contained many spelling errors. When I questioned the teacher on how a paper with so many spelling errors could get such a high grade, she said that she was teaching history, not spelling. Students in that school obviously take spelling only to pass spelling tests. Your students will not learn *WordPerfect* to pass the *WordPerfect* exam.

Too often we leave our users to work out their practical applications in their offices. It may not sound sufficiently university level to teach courses on "Doing Your Budgets With *Excel*" or "Communicating With Your Students Electronically," but most users would like to see courses aimed directly at what they need to do. Your introductory, intermediate, and advanced courses on any topic may be efficient to teach, but they may not be efficient for learning. Your users are not generally IT people. When they leave your course on *Word* they will not be assigned to your help desk and bombarded with arcane questions. They just need to go back to their offices or carrels and get a memo or bibliography done.

In addition, your users have support material they did not have in the past. Any bookstore has hundreds of books on software. (Your courses might tell them which are best.) There are also on-line help systems and FAQs on the Web that they should learn to use. And of course all their peers use computers. Your courses should assume that users have access to this wealth of material. They need to learn how a pro applies the software tools. If you don't cover some nuance or feature, they can look it up.

Timing

Do we consider our users when we schedule minicourses? Not always. Many users can't get time off during the working day or on certain days. For some, staying late creates child care or carpooling crises. If we really want users to attend our courses they must be offered at varying times and at times best for our users. That might not be the times best for our instructors.

One minicourse schedule on the Web lists courses that have prerequisite courses that are taught after the courses for which they are required. I guess it will take you two semesters to learn this stuff. Too bad if you need to learn it now.

Users often have very busy schedules and sometimes cannot be sure they can attend a course until the last minute. Does that make them less deserving? Is ability to pay a good criterion for who you train?

Barriers

Bad timing is only one of the barriers that we create for our users. Registration and charging are two others. The arguments for both of these deterrents to learning make sense for university students. They just scare off the people you'd most like to attract to your minicourses.

"People who register (and/or pay) are more serious about wanting to take the course and are more likely to show up" is the often-heard plaint. But your users often have very busy schedules and sometimes cannot be sure they can attend a course until the last minute. Does that make them less deserving? Is ability to pay a good criterion for who you train?

But what if someone doesn't show up, or too many people show up, or someone who shouldn't be taking the course shows up, or ... ? With minicourses you should trust the market. Serve anyone who wants to learn. You want to attract motivated learners, students who really want to be there. And you want as many of them as you can get. To do that you have to lower the barriers to learning, not raise them. Educated users save you time and money. They call your help desk less, provide good technical advice to their peers, do their work more efficiently, and think better of the IT group who made them so adept at their jobs.

In the ideal minicourse you'll have motivated students being entertained by a compelling, people-oriented teacher who is teaching material he or she uses and thinks is really neat. People do not readily learn unless they are presented with compelling information in an entertaining way. I have seen advanced math and physics taught in such an entertaining way that it seemed the class couldn't be learning anything—it was too much fun. As a course provider or a student you shouldn't settle for less.

Choosing the wrong people to teach your minicourses will doom any possibility of any learning by all but the most persistent students. An instructor who has done nothing but teach the material and does not regularly use it should never be allowed to teach a minicourse. He or she might know every nuance of every command, but there is no substitute for practical, hands-on experience.

Other Barriers

Minicourses often have little or no budget and few formal staff. Without organizational commitment to training, it would be amazing if any group could do this effectively. Having a high-level commitment to doing training at least allows you to try to remove some of the barriers to learning. Can you get proper teaching facilities scheduled when your users need them? Is there a lab where your students can practice what they've learned? Do they have the hardware and software in their offices that you teach them or when they return to their offices, do they seem to have traveled backwards in time? Will they get good support after the class is over?

One of the least-often considered barriers to learning is having systems that are too hard to learn. A difficult system requires a great deal of complex documentation that will be hard to write and that no one will understand. It requires long complex courses and puts a burden on your help desk. It also is less likely to be used or at least, will be used much less effectively. An important part of doing training right is to provide feedback to your IT staff about system complexities that should be removed.

A Few Other Things

Technology is changing rapidly and budgets are being squeezed. Under these circumstances, survival requires new ways of doing what we used to do. For example, as part of your training you should recommend the best reference books to your users—maybe that's all they need. There are many videotapes and CD-ROM courses available. Search out and acquire the best of them and make them available to your users. There are also many useful on-line reference sources.

But some of the educational needs of users cannot be solved by any of these means. They really need to bump into the IT experts in the hall and chat about some problem or project they are toying with. To meet this need, our Advanced Technology and Applications group sponsors a monthly "Exploration Hours" during which any of our users can wander in and chat with the people working on future university systems. While topics of interest are advertised, users can discuss anything. And of course there is no registration, cost, or even time to arrive (as long as it is during the afternoon each month we do this). Users get to learn about new things before they happen, and the people building our future systems get to hear what our users really want—before those systems are built.

Our punched cards are gone and our mainframes will soon follow. It's time our old minicourses were retired too. They need to be replaced with responsive, results-oriented courses taught innovatively to motivated learners who are encouraged to learn the systems we have simplified. That's not simple to do, but the users are counting on their IT groups to do it. Who else would you trust to teach your users about computers? ■

"Many (teachers) resent providing instruction in a learning environment that often strikes them as an overblown video game. The question of simulation is posed from preschool through the college years.... Why should eighteen-year-olds do virtual experiments in virtual physics laboratories? The answer is often: because the simulations are less expensive.... But these answers beg a large question: Are we using computer technology not because it teaches best but because we have lost the political will to fund education adequately?"

Sherry Turkle
"Seeing Through Computers: Education in a Culture of Simulation"
The American Prospect
March/April 1997

In Future Issues

- *How technology is changing the mission of higher education*
- *Models for supporting the development of instructional materials*
- *How the CIO role has changed, with more change coming*

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EDUTECH RESPONDS

Q. We are thinking of setting up a liaison program between the Computer Center and our administrative offices, assigning one programmer/analyst to each area. But we're worried about the more senior or more accomplished programmers. Is it really fair to assign them just to certain lucky departments?

A. *Let's assume that you really mean a liaison program and not a system of dedicated programmers. In a liaison program, the IT staff member acts on behalf of the whole administrative support team and calls on the rest of the technical people as their expertise is required. If you can pull off that kind of teamwork, you'll probably reap some benefits from a liaison system. For one thing, it is easier to relate to a particular face and name than to an acronym like "ITS." People like knowing who to call up for support. The loyalty builds up in both directions as the liaison and the user department solve problems together. It's also easier to understand the workload of a personalized human being. Somehow it's not so bad to hear that, say, five people are supporting forty departments. But when you hear that one person (your liaison!) is supporting eight departments, that's shocking. This can help lead to more reasonable and realistic expectation levels and can put the users on your side when you're ready to ask for additional staff resources.*

Q. We're about to start a campus-wide planning effort for information technology but we've already gotten off track in trying to define the difference between a "long-range" plan and a "strategic" plan. Can you help?

A. *When planning for IT (beyond creating a one-year budget) first became popular about ten years ago, many people assumed that "long-range" and "strategic" meant the same thing. Since then, it's become useful to make a distinction between them: long range refers to a plan that covers a greater-than-one-year span of time, usually either three or five years. A strategic plan, on the other hand, focuses on the mission, values, goals, and objectives that make IT a strategic resource of the institution, regardless of the timeframe involved. The distinction is an important one, especially with the understanding that a strategic plan for IT is directly tied into, and contributes to, the mission and goals of the institution itself.*

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EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

Leadership in the New IT Organization

James I. Penrod, The University of Memphis

It is clear to most of us in higher education information technology that the load on our IT organizations is heavier than ever before, and that the management of IT is more complex. Equally clear is that the increasing workload and complexity are bringing significant service and delivery problems along with them. According to many surveys, a very small percentage of CIOs think that their IT organization is very effective and an even smaller percentage believe that their internal clients would rate their IT unit as very effective. It is imperative that our IT organizations begin to excel in new ways, and as more and more surveys and studies are done, the necessary ingredients for success are beginning to emerge. Visionary leadership, competent execution, comprehensive management development, technical training, strong systems development, and service delivery processes are the ingredients that produce highly effective results and form the foundation for positive, trusting relationships with internal clients.

What is Missing?

Few would argue with the typical client's rating of their IT unit. The question that most of us would like answered is, "How does an IT organization attain the characteristics that lead to success?" The situation with IT organizations today is similar to a heart patient who has just had bypass surgery and is given medication that will help his or her condition. But the only thing that will really enable a longer, healthier existence is to change the habits of a lifetime. The patient will need to stop smoking, improve eating practices, exercise regularly, and take time to relax. The patient is faced with adaptive challenges, the need to make specific behavioral changes in daily living. The physician

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"There are three sides to any innovation—technological, educational, and institutional. We have placed too much emphasis on the technological aspects and expected the educational endeavors and institutional environment to change to accommodate technology. We need to establish a three-strand approach to integrating technology with teaching/learning."

Kamala Anandam
Miami-Dade Community College
Posting #111 to *AAHESGIT* list
4/30/97

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NEWSBRIEFS

ACM PROGRAMMING CONTEST

Harvey Mudd College in Claremont, California earned the title of computing world champion from a field of 50 finalists in the 21st annual Association for Computing Machinery (ACM) International Collegiate Programming Contest. The Contest is considered one of the top collegiate computer science competitions in the world, showcasing the achievements of computer science students worldwide. The Harvey Mudd team outpaced their competitors by six minutes in a five-hour race to complete as many real-life programming problems as possible. The University of Washington and the University of Queensland tied for second place. Microsoft, the sponsor of the Contest, awarded educational scholarships totaling $31,500 and approximately $225,000 in software to the top ten teams in the final competition. Over the four years that Microsoft has sponsored the Contest, it has contributed more than $27 million in software site licenses and support to the participating teams and schools.

For more information, see http://www.acm.org/contest.

DEVELOPING WEB-BASED ADMINISTRATIVE APPLICATIONS

WebdevShare97, sponsored by CAUSE, is the conference for managers and professionals in higher education focusing on development and delivery of effective Web-based administrative systems. The conference will be held on the Bloomington campus of Indiana University, October 20–22. On Sunday, October 19, pre-conference seminars will be held that will help those who may wish to have some in-depth exposure to many of the basic techniques used in Web development.

The purpose of the conference is to provide a forum for sharing information and techniques on data retrieval and analysis, on-line transaction processing, report generation, training, and documentation for college and university administrators and IT professionals. The regular conference program will feature the capacity of the Web to handle administrative problems in all higher education administrative sectors, including financial, student services, and human resources management.

For more information, contact Indiana University Conference Bureau, IMU 671, Bloomington, Indiana 47405; (800) 933-9330; cbtech@indiana.edu.

SNOWMASS THIS YEAR

"Making IT Happen: Content, Conduit, and Culture" is the theme of this year's Seminar on Academic Computing, to be held August 3–6 in Snowmass, Colorado. Meant for directors and managers of computing, information, and communications services, as well as campus executives, CIOs, CAOs, deans, librarians, faculty leaders, and policy makers, the seminar is geared to respond to technology support issues faced by campus leaders who share in the responsibilities for the programmatic direction and use of information technologies in higher education.

For more information, see http://www.cause.org/sac/sac97/sac97.html.

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Leadership in the New IT Organization...

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may be able to help motivate and make recommendations about beneficial actions, but it is the patient who must make the changes. IT organizations of today and the near future have similar challenges. Changes in society, the student population, governmental attitudes toward higher education, competition, internal clients, and technology are forcing IT organizations to clarify their values, develop new strategies, and learn new ways of operating.

Thus there are two difficulties that must be addressed. The first problem focuses on leadership. Leadership must be different from what it has been to date in most IT units. New leadership must motivate and help people do adaptive work, and this varies substantially from what leadership has required in the past. The second difficulty lies in the prevailing culture and climate of many existing IT enterprises. The "unwritten laws of practice" can make it difficult to significantly change the way things are done, yet that is exactly what is called for in many circumstances.

Elements to Understand

If we are to refocus leadership and design institutions to foster community and citizenship, some first steps would be to understand, as Peter Block says in his article, "The End of Leadership":

Meaningful conversations have power. Focus on the questions rather than just the answers. Structure time so that real dialogue is possible. Appreciate that struggling with difficult issues builds commitment. Slow down the rush to make decisions and invite more reflection and understanding.

Connection precedes content. Each shift in technology, work process, curriculum design, role or responsibility demands trust, dialogue, and relationship if it is to succeed. Patience is required, feelings need to be valued, and relationships discussed. History needs to be acknowledged and put to rest. Spend more time on purpose and collectively define it rather than expecting the leader to answer all questions and sell the change.

Changes in society, the student population, governmental attitudes toward higher education, competition, internal clients, and technology are forcing IT organizations to clarify their values, develop new strategies, and learn new ways of operating.

Freedom is a choice. Every one of us has a part in creating a culture, living a vision, resolving a conflict, and ensuring that the institution fulfills its mission. Each of us needs to walk our talk, and offer hope and inspiration. When we leave such tasks to leaders only, we let people off the hook and undermine accountability.

New Leadership Convictions

In such redefined organizations the tasks of leadership will be to convene people and engage them in the everyday challenges of how to plan, organize, discipline, and ensure that the right people are on the team and doing the job right. Leaders will:

Believe that employees are capable of using their freedom to serve the well being of the institution. If most employees act responsibly and a few do not, why focus on the irresponsible? It is time to create organizations that fit the committed and caring.

Value the act of convening as a primary part of one's job. Defining the critical questions and determining who should participate in the conversation are tasks for every moment. Meetings are not a distraction from work and thinking is not lost production. People talking and deciding is the work in the new world.

Learn how to design a meeting. Robert's *Rules* are for order, not for rethinking work and building commitment. Clear agendas, minutes, votes, allocated time, and postponed tensions are artifacts of efficiency from the industrial model. Learn about dialogue and open space methods, conference models, valuing tension and conflict, surfacing the diversity of purpose, and encouraging the face-to-face exchange of wants. Take over the design for productive interaction from trainers and consultants.

Decentralize. Be a focusing lens, define the difficult issues, and then join the group as a powerful equal. Democracy is not defined by the actions of elected officials but by the actions of citizens. The same is true in the workplace. Use the special powers of office infrequently

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and then only when collective efforts have been exhausted. Learn to listen, ask questions, express doubt and uncertainty. Learn to say no to those who want you to make their decisions for them.

Forge partnerships with others at the same organizational level. Lateral relationships are the most difficult to manage in the patriarchal world of bureaucracies. Learn to cooperate with, yield to, support, and affirm the actions of peers both within and outside your department. Accept accountability for the well being of the whole organization by willingness to give up power, territory, or even budget when it is best for all.

To do these things leaders need to break long-standing behavior patterns of their own—providing leadership in the form of solutions. The locus of responsibility for problem solving when an organization faces adaptive change must shift to its staff. Solutions to adaptive challenges are not found in executive suites but in the collective intelligence of employees at all levels, who will need to use each other as resources, often across divisional boundaries, and learn their way to solutions. According to Ronald Heifetz and Donald Laurie, writing in a recent *Harvard Business Review*, six more principles guide the leadership of adaptive work:

Get on the balcony. IT leaders need to be able to view patterns as if they were on a balcony. They must see a context for change or create one. They need to provide an historical context and identify what is good about the past, as well as furnish an idea of the forces of change at work today and the responsibility that individuals must take to shape the future.

Identify the adaptive challenge. Leaders need to listen to the ideas and concerns of employees and those who receive services. They need to examine conflicts and determine when the root causes are grounded in differing values and norms. They must recognize that the management team embodies the adaptive challenges facing the organization, hold a mirror up to themselves, and identify changes they will need to make.

Regulate distress. This is perhaps the most difficult aspect of adaptive leadership. The pressure to reestablish equilibrium is tremendous. Eliminating stress removes the impetus for individuals to make behavioral changes, yet people cannot learn new ways of doing things if they feel overwhelmed. A delicate balance must therefore be maintained for there to be a productive level of tension. A leader must have the emotional maturity to tolerate uncertainty, frustration and pain, while projecting a confidence that the organization can tackle the difficult tasks ahead.

> *Solutions to adaptive challenges are not found in executive suites but in the collective intelligence of employees at all levels.*

Maintain disciplined attention. All sorts of work avoidance should be expected when taking on adaptive work. Scapegoating, denials, focusing on familiar technology or processes, attacking individuals rather than the perspectives they represent, or taking offense at others' questions are common examples. When sterile conflict takes the place of dialogue a leader must step in and put the team to work to refocus and reframe the issues to deal with the hard questions.

Give the work back to people. Everyone in an organization has access to information that comes from a special vantage point. People who sense early changes are often at the periphery, but for organizational success that information needs to be brought to bear on tactical and strategic issues.

Protect voices of leadership from below. Leaders in senior positions must rely on others within the organization to raise questions that may indicate a needed adaptive change. Others often have the perspective to provoke rethinking that senior administrators do not, and perhaps cannot.

Culture and Climate

The style of leadership just described would not work in many existing organizations because the culture and climate would not support it. Thus we see the observed failure rates of TQM, reengineering, or other such creative methodologies. Changing the culture and climate of an organization so that 21st century leadership will work requires bringing alignment to the enterprise. Alignment occurs when a group of individuals work as one, with a deeply shared sense of purpose and vision, and when organizational processes, systems, and structures are in synch to provide consistent support to the group decision making. Unfortunately, creating alignment is not simple and setting out directly to do so will usually make the problem even worse. Alignment should be thought of as a byproduct of several interacting factors or forces rather than a direct solution.

In addition to the new leadership describe above, there are other factors important in alignment, according to N. Dean Meyer, in his article, "The New Organizational Operating System":

Culture. The organization's behavioral patterns and habits may signal a need for change by a lack of individual empowerment, accountability, client focus, creativity, productivity, or quality.

Structure. Traditional "chain-of-command" structures and control mechanisms may show a need for redefinition in reporting and roles.

Methods. Procedures and methodologies that are oriented toward external controls, extensive standard operating procedures, and periodic planning cycles are not likely supportive of 21st century needs and need to be re-thought.

Internal economy. The budgeting, charge-back, priority setting, and project approval processes that support unsubstantiated incremental adjustments, charges based on long standing algorithms, or priorities based on power rather than mission alignment need examination.

Metrics. The feedback loops that inform individuals about how their performance is being perceived and the incentives for improving performance that do not connect individual work plans to measurable organizational objectives, link individual performance to some teamwork measures, or allow people to understand how what they do fits in the big picture need revision.

Systems architecture. A design that enables continuous upgrades without major disruption of service and flexibility to provide new services is necessary.

Strategies Necessary for Transformation

Transformational—that which enables fundamental change—leadership is needed now. Employees are being asked not only to behave in new ways, but to behave in ways that contradict the way they have been taught and have found to be successful in the past. Therefore one of the primary leadership roles is to design and orchestrate a resocialization process. Methods that communicate behavioral messages can work together to constitute a successful resocialization strategy.

These methods, outlined by Joan Lancourt in her article, "Leading Organizational Transformation," include *coercion*, any form of influence that plays on the fears of others when their freedom to reject the influence is curtailed, is a necessary step in initiating transformation; *persuasive communication*, which requires trust, openness, honesty, and deep listening as well as the acknowledgment of the emotional aspects of the message; *role modeling*, embodying and expressing the right behaviors and values; *expectancy*, or the "self-fulfilling prophecy," is making assumptions about expected behavior and then taking actions that help to enable such behavior; *participation* is engaging individuals in that which is relevant to their work and is an essential ingredient for fast, flexible, high-quality decision making in an environment of rapid, complex, and perpetual change; *structural rearrangement*, creating structures that are fluid, open, and relational; and *extrinsic rewards*, which is defining the desired new behaviors and then rewarding experimentation and learning.

> *Our IT organizations can no longer be seen as peripheral units but must become recognized as part of the central core of the institution.*

Conclusion

IT organizations face multiple daunting challenges as they prepare for an increasingly important role in 21st century institutions. They can no longer be seen as peripheral units but must become recognized as part of the central core of the institution. Many must complete a transformation process to be prepared to deliver the necessary services. Leadership is the critical component for success.

The new leadership needed to make this happen cannot reside in a single individual; multiple leaders must be identified throughout the institution. A leader needs a deep belief in the ultimate benefit of a broadly inclusive participatory process and trust in the abilities of other people. A leader needs to be able to solidify decisions and move forward. A leader needs to have the ability to hold a long-term shared vision in the foreground and to have patience as everyone learns new ways of doing things. A leader must have the willingness to listen deeply, to take risks, to experiment, and to understand that his or her own empowerment does not depend on controlling and commanding others. Finally, a leader must acknowledge that transformation does not come quickly, it will take several years—and it is never done. The challenge is to learn how to move through transformative cycles more quickly and easily to accommodate the changing world in which we live and work. ■

Support for Multimedia Development

by Alan Levine, Maricopa Community College

Many models for instructional multimedia development have been advanced recently, including the interesting idea of a "Drive-in-drop-off-an-idea-pick-up-a-CD-ROM-later" faculty support center. This, however, is likely a mythical concept that cannot be scaled without crippling an institution's resources. It has failed before. While many worthwhile multimedia titles are commercially available (five- or six-digit-budget productions?), a large number have little more interactivity than click-and-see, click-and-read.

As a multimedia developer, I always stress the tradeoff between the flexibility and complexity of a presentation or interaction idea, and what it will take in time and effort to produce it in technology. With the size of our organization (ten colleges, 950 full-time faculty, 2000+ part time) and the relatively tiny number of technology specialists with backgrounds in instructional design, that tradeoff is often just not possible.

An instructor involved in a technology development project needs to be more involved than handing an idea across the counter. Much more.

Our center supported an experimental faculty/multimedia project called "Studio 1151" where we took a different route for educational technology development. We commissioned two teams of one faculty and four or five students each to spend a semester doing the design and development of a technology application (not the production). Each of the faculty/student teams identified a concept (based on the criteria of something difficult to teach and difficult to learn), developed flow charts, storyboards, and timelines; researched locations; wrote scripts; and acquired much of the media (photographs, digital sound recordings, video).

Our office sponsored three re-assigned hours for the faculty, developed a design guidebook and structure, facilitated the design process (using an intern who is an instructional design doctoral student), and with our technology staff of myself and a part-time student programmer, transformed the design into a product. All of our content is original; the students involved in acquiring media had to get release forms signed by anybody that appeared in their photos and video shoots.

As a multimedia developer, I always stress the tradeoff between the flexibility and complexity of a presentation or interaction idea and what it will take in time and effort to produce it in technology.

The real goal was not a product (although we got some great ones), but promoting the process where faculty and students worked as a team, in a different environment than the classroom. Our evaluation indicated positive examples of a change in perspective for both the roles of students and instructors. The teams continued to provide time and energy months after the semester project had ended because they were involved and personally invested in the whole process.

For example, the students in one group wanted to continue into the first summer session and kept meeting on a weekly basis, even though none of them signed up for credit. The other group participated the following fall in a presentation at the League of Innovation Conference—all of the students met a few weeks prior to the conference, and dutifully volunteered to assist in writing parts of the presentation as well as to speak in front of the audience. This was several months after the semester in which they had participated in the project!

The student who assisted in the technology work was also invested (even though he moved on to another job) because he was brought in early in the idea development stage.

The team in Psychology came up with a wonderful concept called "Negative Reinforcement University (NRU)". Because we have so many other projects, the technology production time lasted beyond that semester, and has totaled at least two hundred hours. We have developed a highly interactive simulation environment that addresses one of the most difficult concepts in psychology.

The interface (as suggested by the group) is non-traditional (no buttons or menus, more like the navigation of games like *Myst*) and is rendered in surrealistic 3-D imagery. In NRU, you must explore

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Alan Levine was a geologist and is now a technologist with Maricopa Community College. This article is based on his recent posting to the AAHESGIT list.

your way and earn your diploma in Negative Reinforcement. There is a lecture (content) that leads to a simulation, a "lab" where you can explore and experiment with different videotape examples of negative reinforcement (scripted and videotaped by the students), and a testing room where you can attempt to earn your degree.

Anywhere in NRU, you have readily available a "Gizmo," an on-screen digital assistant device that you can get help from, take notes in, read background information about negative reinforcement, and quickly exit the program. The Gizmo is saved as a computer file. This again was another idea created by the student/faculty team, and we were able to build in the ability for the students to view the Gizmo outside of the main program. Better yet, we are behind the scenes logging all of their steps in NRU so we can evaluate the program by looking at the logs of different users (a separate tool for the instructors allows them to look at the logs of the Gizmo files).

Another interesting point is that we have created a very exciting multimedia program, which in all, may represent only a single digit percentage of the content of Psych 101! The team's goal was not to computerize an entire course, but to apply technology to a part of a course, especially a difficult part, that could be enhanced by technology.

It is difficult to imagine, given our resources, scaling this level of effort to a large number of faculty (we were stretched to support just the two teams). Questions that each institution needs to consider in determining and applying resources include whether it fits within the institution's mission to produce commercial quality multimedia and whether it is critical to involve not only faculty, but also students, in the creation of innovative educational applications of information technology. ■

Note: You can take a tour of the NRU program by walking through screen shots at the Web site below; you can also compare the finished screens to the original storyboards.

Studio 1151 Project:
http://www.mcli.dist.maricopa.edu/authoring/studio/

Negative Reinforcement University:
http://www.mcli.dist.maricopa.edu/authoring/studio/nru

"As with any new pedagogy, we need to learn how to best maximize the new opportunities technology provides. This means more than just learning what *not* to do (deliver a lecture online). It also means designing new ways of learning that fully utilize these new capabilities. The brave new world of university learning will be neither entirely virtual nor entirely grounded in the physical campus. Thinking outside these bounds, new worlds of learning count on both community and communion, whether fostered by face-to-face encounters or by technology-mediated communication."

Sue Talley
National Center on Education and the Economy
"EdTech Does It Online at Pepperdine University"
T.H.E. Journal
May 1997

In Future Issues

- *The desirability—and the essentials of—project management*
- *Models for supporting development of multimedia instructional materials*
- *New behavior strategies for IT professionals in higher ed*

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EDUTECH RESPONDS

Q. It's pretty much been the responsibility of the computer center up to now to set their own priorities, but it's time for us to change that. We need to make decisions about what gets done in a more collaborative way. On the other hand, we don't want a committee having to get involved with every single request for services that comes along. Is there a better way to do this so that it happens both fairly and efficiently?

A. *The key is to have your committee determine the priority criteria, not the actual priority for each request. For example, your institution might decide that for the next year, it is going to place a lot of emphasis on enrollment management, so that any request for IT services having to do with student recruitment and retention will have a higher priority than anything else. You may have other categories of criteria as well, such as the numbers of people who will be affected by the request outcome, or how much money the institution will save if the request is granted, and so on. All of the criteria and their relative weights should be determined by your committee; deciding actual priorities as each request comes in should then be a fairly mechanical process, not requiring the committee's involvement.*

Q. I am trying to convince the vice president for whom I work that our new information system replacement project needs his involvement. He is reluctant, mostly due to an already overloaded plate of responsibilities, but I want to keep trying. How can I make a convincing case?

A. *There is clearly a major role and responsibility for a senior-level sponsor. Part of it is to make sure the new system does more than simply replace the functions provided by the old software by initiating a hard look at current operations and procedures with the goal of strengthening the institution, a task usually requiring both perspective and clout. Another part is to ensure that the proper resources are available for completing the project according to the standards that the institution has set for it. Finally, your vice president is in a unique position to inform the rest of the administration and the institution as a whole about the importance of the project and to recognize the contributions of those who carry it out.*

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EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

PMS: Project Management Syndrome

Howard Strauss, Princeton University

Even before our ancestors dropped out of the treetops and became hunters and gatherers, they realized the advantages of planning. Once they were off collecting strawberries or stalking vicious predators, only those that understood the value of project management survived for long. They knew that if they just leaped out in front of saber-toothed tigers without a plan, they were more likely to be dinner than to have dinner. Through the ages we've all recognized that preparing to work can be the most important part of getting anything done. As Abe Lincoln said, "If I had eight hours to chop down a tree, I'd spend six sharpening my ax." Project management is just an extension of getting your ax sharp before you hack away at a tree with a dull blade.

Project management is not only desirable, it is essential. At some level, project management is required to do even the simplest tasks effectively. Since failure to manage projects will almost certainly cause them to fail, we often assume that a failed project failed because it needed more management. But there are hundreds of other reasons why a project might go nowhere. For example, even the best project management will not make up for a lack of vision or leadership.

When projects are out of control, one could try to understand what the problems really are, but that is hard to do. It is much easier to just assume that more project management is needed. When that choice is made repeatedly, it inevitably leads to Project Management Syndrome, or PMS, a condition that makes organizations inefficient, bloated, and causes them to behave irrationally. An organization suffering from PMS may appear

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"The world of education has changed from an orderly world of disciplines and courses to an infosphere in which communication technologies are increasingly important. While education is changing, it is not changing fast enough. It is clear that in the future we will see a major restructuring of our social, industrial, and educational institutions, and an increased reliance on computers and telecommunications for work and education."

Andrew Molnar
National Science Foundation
"Computers in Education:
A Brief History"
T.H.E. Journal
June 1997

NEWSBRIEFS

INFORMATION TECHNOLOGY IN THE LIBERAL ARTS

Rethinking Teaching and Learning: A Reformation of Liberal Arts Education With Information Technology, by Grace Johnson-Page, Assistant Professor of Management and Accounting at Marietta College, is the result of a sabbatical leave in 1996 used to identify and interview a collection of liberal arts college faculty using information technology in the hopes that their stories would "inform and ignite a spark in those faculty interested in using computers but not sure how or where to begin." Johnson-Page's report includes examples of specific projects and techniques that administrators, faculty, and librarians are using to adopt and adapt information technology on their campuses.

The report and all of the interviews with faculty members at 26 colleges and universities are on the Web at http://www.marietta.edu/~johnsong/reform/.

COMPUTER ACCESS FOR PERSONS WITH DISABILITIES

Information Access and Adaptive Technology, by Carmela Cunningham and Norman Coombs, is a new resource from the American Council on Higher Education/Oryx Press Series on Higher Education. It discusses the necessity and the impact of computer access for persons with disabilities. Chapter topics include higher education's obligation to people with disabilities, the relevant laws, planning and staffing adaptive computing services, creating accessible workstations and facilities, matching technology to people, the Internet, library access and service issues, and science and mathematics issues.

For more information or to order the book, contact Oryx Press at (602) 265-2651, or see http://www.oryxpress.com. A description of the book can be found at http://www.oryxpress.com/books/iaat.htm.

ON-LINE INSTRUCTIONAL MATERIALS

A new project, sponsored by the Emerging Technologies in Instruction Committee of the Association of College and Research Libraries (ACRL) Instruction Section, in conjunction with the Coalition for Networked Information, is intended to provide an effective method for librarians to display and share instructional materials that they have designed for teaching the subject of seeking and evaluating information in a networked environment. According to the Committee, it is their hope that sharing these resources will assist librarians in responding to the challenge posed by digital technologies.

The project solicits Internet guides, syllabi, and other materials designed for user education; reviews the methodology, content, organization, currency, and use of technology of submitted materials; shares those materials which receive excellent reviews; and collects and shares non-reviewed sites of interest to ALA/ACRL members.

Examples of accepted projects, submission guidelines, and a submission form are available at http://www.cwru.edu/orgs/cni/base/acrlcni.html.

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PMS: Project Management Syndrome...

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well organized—and certainly will appear busy—but in fact very little real work will be getting done. The volume of its status reports, its appetite for people and equipment, and its sophisticated management schemes will belie the fact that most of its work and resources are devoted to taking care of itself—not doing any useful work for users. Its organization charts and minutely detailed job descriptions will not have any relationship to what its people are actually doing.

What do organizations suffering from PMS typically do? They add more project management to get better control of a situation that is caused by the abuse of project management. Once entered, this is a difficult spiral from which to escape. The best defense is early detection. If you see any of the following symptoms in your organization, seek professional help immediately.

All organized and no place to go

Dust off your top-level organization chart. You know, the one with the IT VP in a box at the top and a half dozen or so major boxes below it. Are the missions of the organization as a whole and the missions of each of its major boxes clear to you? Does everyone from the highest manager to the lowliest clerk in the organization agree with and support that view? If they don't, how can you expect them to work effectively to fulfill the aims of the organization?

Whether it's because those goals have never been articulated to the staff, because management thinks the staff doesn't really need to know this stuff, or because the organization has no clear goals and no clear idea of how to achieve them, the result will be the same. The organization will wander about aimlessly until someone decides that something needs to be done. Too often that "something" is "We need to get better organized." The result of that will often be PMS.

Reorganizing

While the Titanic was sinking, it is an oft-told tale, folks busied themselves with rearranging the chairs of the listing deck. When an organization is sinking, managers often busy themselves with rearranging the boxes on their org charts. At least rearranging the chairs on the Titanic did no harm.

What do organizations suffering from PMS typically do? They add more project management to get better control of a situation that is caused by the abuse of project management.

Frequent reorganizations may look like effective project management in action, but they are really signs of desperation. On the plus side, they allow one to blame the bad things that were happening before the reorg on the fact that the organization was not properly organized to do whatever it was supposed to do. (Whatever that was. If someone knew that then maybe they'd get on with doing it instead of reorganizing.) Once there's been a reorganization, of course, it's not reasonable to expect things to work smoothly while people are learning their new roles. So the continued lack of productivity and focus really needs to be excused until the effects of the reorganization take hold—say in three to six months. If things don't get better by then, one can always reorganize.

To a great degree, organizations are self-organizing. Those who are really in touch with the staff understand the relationships that are not on the org charts. Suppose the org chart says that Tom works for Mary who works for Sue. You might discover that Tom really is interested in what Sue is doing and really works for her. Sue thinks this is great since she has someone who is enthusiastic about getting her work done, and since Mary who really works for no one and pays no attention to Tom, doesn't care who works for whom, the organization chugs along. No matter how you move the boxes around on the org chart Mary will do pretty much what she wants and Tom will continue to get Sue's stuff done. Unless, that is, you promote Tom, making him too busy to do Sue's work and giving him staff who discover he is a terrible manager and rebel or quit.

Why there is such a strong belief that reorganizing will solve the problems of an organization that isn't working is hard to fathom. Maybe it is related to the knowledge that very complex life forms emerged from the primordial ooze just by random recombinations of chemicals and the frequent application of lightning bolts. But that took hundreds of millions of years. That is how long it is likely to take before this technique produces the "right" organization—if ever.

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Howard Strauss is Manager of Advanced Applications at Princeton University and a frequent contributor to this newsletter.

PMS: Project Management Syndrome...

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If it looks like work...

No one can do a good job of directly managing the work of someone if they do not understand the work that person is doing. If you want to manage the work of a programmer, you had better be—or have been—a superb programmer yourself. Your manager in turn needs to intimately understand the work that a person who manages programmers does—which is quite different than just programming. Effective mangers need both management skills and the skills of their direct subordinates.

If a manager does not really understand the nature of her staff's work she will not be able to manage the work they do. Her best bet under such circumstances will be to enthusiastically lead in the right direction and hope that her staff will do brilliant things. This sometimes works, but it takes a delicate hand and a deep understanding that leadership will work better than management.

Pointing in the right direction and giving your staff free reign, however, is not satisfying to many managers. "We are the managers," they think, "and we will manage." But since they cannot manage the work of their staff—because they do not really have a clue as to what that actually is—they tend to manage proxies for work.

Don, a manager responsible for a staff of engineers, could see that they spent lots of time at their sloppy desks doing computations beyond his comprehension. Worse yet, although Don's engineers did outstanding work, they were never known to meet a deadline.

Don could see pretty clearly that the problem was how sloppy his engineers were. When he went home at 5:10pm, as he always did, his desk was neat as pin. So he instituted a clean desk policy. Every night between 4:30 and 5:00 he would inspect the desk of each engineer and insist that the top be perfectly clear. Not even an errant pencil was allowed. Don soon had the neatest office space. He also had the highest turnover of engineering talent in his organization and his engineers no longer worked past Don's 5pm inspections.

Were Don's deadlines better met by having clean desks? Of course not; deadlines that were missed by a week or two with sloppy engineers working 10-to-12-hour days were now missed by months by engineers with clean desks working seven-hour days. Don blamed his worsening problems on his high turnover and when last seen was considering a dress code for his engineers. After all, wearing a jacket and tie makes you feel more at work and makes you think more precisely.

> *No one can do a good job of directly managing the work of someone if they do not understand the work that person is doing.*

If you manage proxies for work, that is all you end up managing. The appearance of work is just that. It is rarely related to actual work. And there are countless things much more tempting to manage than real work.

Quantity is another thing easier to manage than real work. It is much harder to write something concisely than something that rambles on. For a program, making it shorter usually makes it easier to read, makes it run faster, and keeps its maintenance cost down. It does however, take longer to write. But it is easier to judge performance by the quantity of output rather than the quality. Especially if you don't know how to judge quality.

A manager who understands what is going on will not accept proxies for work. He will examine the work his staff does and challenge them to do greater things. He will not tolerate them wasting his time with 50-page reports that should be one page long, and he will not waste their time with rules, regulations, reporting requirements, and meetings unrelated to the work they, in all probability, love to do.

Precision

Humans like to count and measure things. Any televised sports match provides more statistics than a statistics textbook. Once we have something measured, it somehow seems more real, and we can do all kinds of neat things with it. We can sort it, average it, compare it, and publish it with as much precision as our computers can handle. We collect data of dubious value and accuracy and massage it until it glistens like gold. Then we use it, instead of our best judgements, to make decisions that we imagine are based on hard data.

An organization suffering from PMS collects all the data it can. More data is better than less. Instead of tracking a dozen attributes of a project, track 50 or 100 of them. You'll understand the project better the more things you measure. Monthly or quarterly high level reports just won't do. Have your staff produce weekly or daily activity reports, and get those re-

ports coming in from every corner and level of your organization including the smallest and lowest levels. Make sure they cover every activity in your organization. You can't have too much data.

Collecting and massaging lots of data will keep everyone busy. You'll have lots of nice reports to prove to people that you are actually an organization that is hard at work and one that knows exactly where it is and what it is doing. Maybe that will make your users forget that you are not delivering the high level of service they should be getting. If it doesn't, you might try hourly project reports.

A meeting of the minds ———
A meeting of ten software mavens was called to decide the best software package to use for a future project. Everyone had strong and varied opinions. A list of twelve possible candidates was produced. Then a list of attributes for good software packages was elicited from the group. Each member of the group was asked to assign a weight value of 1 to 19 to each of the attributes, with 19 considered most important. The ratings were averaged to produce a group consensus rating for each attribute. Then each software package was rated by each member on how well it satisfied each attribute by assigning a number from 1 to 19 to each software package for each attribute. These were also averaged. Finally, the rating for each attribute of each software package was multiplied by the group attribute weight and summed. This produced a single number for each of the potential software packages.

Many of the numbers were very close, including that of the winner and the second-place finisher. But the majority of attendees were not happy with the first choice. How could that be? What could be more scientific than this to choose a software package? After all, ten people assigned 2,470 numbers that were weighted and analyzed. One problem was precision. The other was that applying even the best mathematics to a flawed process does not improve it. Here, as in many cases of PMS, when a management tool is mindlessly substituted for leadership and reason, the result is often the wrong answer accurate to a hundred places of precision.

More power to you ———
My power company provides me with a three-paragraph service level agreement. It says that if they agree to be at my house at a certain time, they'll be there within 15 minutes of that time or I'll collect $25. They go on to promise me a few other simple things.

When a management tool is substituted for leadership and reason, the result is often the wrong answer accurate to a hundred places of precision.

Service level agreements are a great idea, but like all other great ideas, it is easy to abuse them. Three paragraphs of service level agreements (SLAs) that are easy to understand and that promise me some payoff if they aren't met gives me a good feeling about my power company. When you write three paragraphs or three pages of service level agreements your interest is probably in serving your users. When you write three hundred pages of service level agreements your focus is the production of SLAs.

Charity begins at home ———
When I donate money to a charity I first find out how much of their income they spend on administration. If it's much more than 15%, I'm reluctant to support them. I want my money to do good deeds, not pay for people keeping track of the good deeds. Your IT organization exists to serve your users. Obviously some of your resources will be gobbled up by internal administrative activities, but how much? Would you donate money to a charity with your administrative overhead rate?

Too little project management has a cost, but so does too much. When you suffer from PMS, project management becomes more important than the projects themselves and "good" project management becomes more important than good user service.

An organization with PMS might spend 60% or more of its efforts managing and taking care of itself. After a while it no longer even needs users to keep busy or justify its existence. Its management systems, reporting requirements, internal projects, recruitment, and reorganizations of themselves require a large organization with a large budget. Its projects frequently come from within and are designed solely to serve the organization. But this is totally backwards.

We should be building things for our users, not ourselves. It would be nice if we could also use stuff that was really intended for our users—not the other way around. While we don't want to be like the shoemaker's children, we can't stay in business if we build shoes—even the finest that can be made—just for our friends and family. ■

When Faculty Write Multimedia: Models of Authorship, Implications for Support

by Thomas Warger, Five Colleges

Faculty authorship of computer-mediated instructional materials dates essentially from the early 1980s, when microcomputers and the BASIC programming language first offered the prospect of easy writing. This was also when computers—that is, microcomputers—became the personal tools of substantial numbers of faculty. Educational institutions, computer manufacturers, government agencies, and charitable foundations put micros on the desks of faculty who promised to use them to create instructional materials and programs that students would use interactively. Faculty workshops on BASIC, Logo, and other authoring environments were also common. To be sure, some impressive work resulted, but many faculty never even completed their initial projects. Still more importantly, this initial cohort did not prove to be the vanguard of a wholesale adoption of instructional technology by faculty. Well over a decade later, the picture is largely the same. What was wrong with the early scenario? And what does this history tell us about what we should be doing now?

We face a tough set of questions, the outline of what has been termed the "support crisis" on campus. First, and universally, how can we possibly meet the cost of developing multimedia programs? We give developmental grants in the four-digit range, but the cost of actually finishing a substantial program can quickly run into five and even six digits. Campus budgets cannot meet those costs; nor will most grants. And because we have been busy building infrastructure on campus, we have lost track of who among the faculty have been busy programming, who have quietly given up after the jump-start workshop we gave for them, and how many more who would like to get started but do not find the help. How will we re-connect with the faculty clientele on a one-to-one basis? Do we have an adequate understanding of what motivates faculty? To all the criteria we once knew we need to add some new ones: a sense that faculty are not advancing in the information age at a rate that will satisfy students; frustration that the action has shifted from faculty support to dorm networking, the Web, and pushing through to 100% provision of computers for staff and faculty colleagues. These negatives impart an urgency that was not there when computers were a novelty. And what is a reasonable level of support anyway? Does anyone with any notion of budgets think that all faculty can be promised technical consulting as needed for programming projects? The toughest question of all cannot even be voiced in public on campus: what is the cost/benefit for faculty time and talent spent in writing software?

The toughest question of all cannot even be voiced in public on campus: what is the cost/benefit analysis for faculty time and talent spent in writing software?

How, then, does anything get done? There are four models of authorship in practice today: solo, partners, teams, and factory. With the exception of "factory," these co-exist on most campuses, though not necessarily by design.

Solo

Solo or artisanal authorship is the old, original way and has produced most of today's applications. Its days are numbered, however, because of the range of skills needed now to do the work in a truly "multi" media project and because this method just does not generalize beyond a relative handful of faculty. These are the early implementers, characterized by self-reliance and a reasonable level of competency, and the implicit model we honor when we offer workshops for beginners or small start-up grants to individuals. The support cost for this model of authorship appears small, but we really do not know how much time and effort are behind the results. Another problem is that there is really no peer review for this work. The efforts expended in this model of authorship tend to be private, idiosyncratic, and narrowly focused—ill effects whose cost is borne by the students who face a fresh learning curve for each of these programs.

Partners

This model results from faculty authors who pair with other faculty, media staff, students, or freelancers. Some of these matches are serendipitous; others more deliberate. A fair number of faculty who would not work alone on multimedia have found this approach ap-

Thomas Warger is Assistant Coordinator for Information Systems at Five Colleges, Inc. in Amherst, Massachusetts.

pealing. They like the privacy and control they retain over the project, and this arrangement does not drag them across the conceptual line into formalized projects and teams—which are off-putting for many faculty. Peer assistance has some advantages: trust, privacy, and informality—these are core values in the worklife of most faculty and feel comfortable when they venture onto unsure terrain. Still, the factors that limit the solo method are still at play here; partnerships are not generally an efficient way to produce complex work. At best, they aid the transmission of interest and enthusiasm from one individual to another—which is very nearly the way faculty come to new pursuits.

Teams

Increasingly, we see a new model that brings together people with technology, teaching, and authoring skills to work collaboratively. This approach is currently the most interesting and promising for those inclined to move into the gulf beyond the modest results obtainable by working alone. The teams cut across departmental and even campus lines. A faculty member might work with a media developer, student assistants, faculty peers, and a freelance specialist—all in one project, perhaps in different phases. The key is to recognize that multimedia courseware has become complex enough to require a specialization of labor. The team members are role players bringing their skills to the project as needed. In this arrangement, the faculty author is less isolated. The labor marshaled under this model comes at a range of prices and can be met by varied funding sources. But the demands of that scramble to find and fund help set their own threshold of participation: this is not a familiar and comfortable way of working for many faculty. The challenge for the institution is to promote and manage this support environment. IT organizations can expand their traditional training offerings to help cultivate the interests and skills of those who might become the team players in question and can serve as brokers, matching faculty authors with those who have the necessary skills and following the results.

Factory

The last model is relatively rare and likely to remain so. The "factory" approach consists of a place and a permanent team that carries the specialization of complex work to its logical conclusion: an industrial model of production. An instructional media development center takes in faculty ideas and requests at one end and puts out finished work (perhaps even shrink-wrapped) at the other. In other cases, technology transfer offices evaluate faculty-produced work for further refinement, "hardening," and marketing. In some other cases, faculty work is picked up for commercialization by a software publishing firm. In all these scenarios quality control, product standardization, and technical currency are the strength of the method. But some degree of faculty alienation also seems to be inevitable—and fear of loss of control is a barrier to wider interest among faculty who might consider writing courseware.

Conclusions

The most productive ground probably lies between solo work and the factory method. But how many academic computing and media services operations recognize the lay of the land and will take steps to promote the team approach to solving this part of the support crisis? The task begins with knowing the clientele—who are the successful faculty authors, the frustrated ones who have given up, the fence-sitters who might be ready to proceed if helped? And who has the talent to help? Is anyone identifying and recruiting freshmen who worked on high school newspapers and yearbooks and have probably used PageMaker and PhotoShop to help faculty? How many campus IT and media staff know what expertise is available at nearby institutions and in the local economy?

Lastly, does the institution have a technology plan for curricular development? Staff support budgets, equipment, labs, and internal grant funds do not rise to the levels needed to advance multimedia authoring if the infusion of technology is considered the local option (and cost) of each faculty member. On most campuses we have not yet assimilated the ongoing equipment costs and staff support implications for ubiquitous computing and networks, let alone geared up to exploit the potential of all that technology to transform teaching. ■

In Future Issues

- *What will the resume of the successful CIO look like five years from now?*
- *What to tell the president about the Year 2000 problem*
- *How technology is forcing academic change to take place at a faster rate*

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EDUTECH RESPONDS

Q. The biggest complaint our users have about our administrative system is data access. They maintain that the query and report-writing tool we've given them is too hard to use and they want us to look around for an alternative. What is the state of the marketplace today? Are we likely to find a really user-friendly tool?

A. *First, it's important that you and your users look together, working as partners to find the right tool. They will bring a different, but equally valuable, perspective to the search. However, selecting a good query and report tool does not by itself solve the problem of data access. Generally, the hurdle for making effective use of campus-wide systems has as much to do with understanding the complexity of the data as with the ease (or lack thereof) of the query tool, especially when using the more intuitive modern query software. Especially in a relational database, critical pieces of data are often stored in separate tables that must be linked correctly to make sense. Effort needs to be put into providing the users with good guides to the data, explaining the business purposes to which each data element is put, the kinds of values each data element can have, and the meanings of any codes that each data element can contain.*

Q. We have a real conglomeration of hardware and software among the faculty. Some faculty members have desktop computers that are way more powerful than they need; others are using ten-year old machines that can't possibly do what they need to do, and still others have just dumb terminals connected to the campus mainframe. It doesn't seem like we should go on this way.

A. *We agree. This is fairly typical on a campus that has relied on individual department or grant-based initiatives for hardware proliferation. The next step in your evolution should now be to develop a campus-wide plan and perspective that will bring a greater level of compatibility in the hardware and software, greater ease of information exchange, and perhaps most importantly, a priority structure that ensures that each faculty member is getting what he or she needs to be productive. On-going funding (even if at a relatively low level) and a decision-making committee will complete the picture.*

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Selecting a New Information System: Basic Principles

The task of choosing a new information system strategy for a college or university can be daunting, especially when the new strategy has to meet a wide variety of goals and objectives. Typically, an institution about to make such a major investment will be trying to accommodate several needs at once, including providing both better information and better information access to the campus community, creating and maintaining more responsive student services, and making the institution more operationally efficient.

But while the objectives of the new information system may be very ambitious, perhaps even taking the institution into unchartered territory, the process for choosing that system does not have to be a complex, convoluted, or horribly burdensome affair. It should, however, be based on some basic principles, in order to insure that the institution will end up choosing the very best and most cost-effective solution.

These principles are particularly important in light of the many and diverse choices available to higher education today. There are, for example, many different approaches to system integration, including best-of-breed, single-system, and hybrid. There are many different system architectures, including centralized, client/server, distributed, decentralized, and Web-based. And there are certainly many different options for application software, database management systems, hardware, and end-user tools. There is no single set of options that is right for every institution, so it is necessary to go through a careful process to choose the right set that will match the institution's own individual needs, characteristics, and resource constraints.

continued on page 3

"All universities are asking themselves what the knowledge media mean for them. Academics effervesce with individual projects. State governors dream of merging higher education into a great 'virtual university.' Will it ever be real? To make it real, we need to understand that the knowledge media give us the opportunity to switch the spotlight from the classroom and teaching back to the individual and learning. Universities are discovering, to their amazement, that with good learning materials, effective networks, and proper support, students can learn better at home than in class."

Sir John Daniel
Open University
"Why Universities Need Technology Strategies"
Change
July/August 1997

NEWSBRIEFS

GUIDE TO FUNDING FOR INFORMATION TECHNOLOGY

The National Guide to Funding for Information Technology has just been published by The Foundation Center, a national nonprofit organization that collects, organizes, analyzes, and disseminates information on private institutional funding. The *Guide* provides essential facts on approximately 400 foundations and corporate direct giving programs, each with a history of awarding grant dollars to projects involving information technology, representing a valuable source of information for colleges and universities seeking to enhance their services with the latest technologies.

The *Guide* includes funding sources, addresses, financial data, giving priorities, application procedures, contact names, and the names of key officials, as well as sample grants and a list of both program areas favored and geographic areas preferred by grantmakers. Each year the grantmakers featured in this volume award millions of dollars for projects involving computer science, engineering and technology, telecommunications, and media to a range of educational institutions and other nonprofit organizations.

For more information, call The Foundation Center at 1-800-424-9836 or see http://www.fdncenter.org.

ON-LINE TEACHING AND LEARNING NEWSLETTER

The National Teaching and Learning FORUM newsletter—a "newsletter for faculty by faculty"—is now available on-line. Through a new site licensing opportunity, this newsletter is now available electronically to the faculties of college and university campuses. Site licensees will receive six electronic issues of the newsletter each academic year. Each on-line issue will include hot links to enable readers to send e-mail to newsletter authors and the editor, connect directly to Web sites mentioned in the publication, and participate in active discussion groups.

For more information, contact Oryx Press at (602) 265-2651, or see http://www.oryxpress.com. A description of the newsletter and ordering information can be found at http://www.ntlf.com.

EDUCOM'97 CONFERENCE

"Embracing the Changing Learning Environment" is the theme of this year's Educom conference, to be held October 28–31 at the Minneapolis Convention Center. Sponsored by the University of Minnesota, the conference will offer more than 100 concurrent sessions, hands-on software and hardware demos, new product announcements, and pre- and post-conference workshops to attendees who include academic computing professionals, policy makers and planners, faculty, administrators, budget directors and development professionals, networking and library professionals, and information technology specialists.

For more information, see the complete conference description at http://educom.edu/web/confsemi/educom97/educom97Main.html.

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Selecting a New Information System: Basic Principles...

continued from page 1

Basing the process of selecting a new administrative system strategy on the following principles will substantially increase the likelihood of making the best choice possible.

The people who will be using the system the most and who will be responsible for making the system work should be the ones with the major voice in the selection of a system. The process needs to be broadly participatory, soliciting input from all parts of the campus, including the faculty and students. We need to expect that all members of the community will be users of the system, at least eventually, and their needs should be taken into account as well as their points of view on the various options.

Consensus among the participants in the selection process is both possible and highly desirable, and should be made a primary goal of the process. Reaching consensus may seem unlikely when first starting out, especially if the individuals involved have not worked on anything together before. But it can be done, in fact, it *should* be done, for the sake of the success of the all-important implementation phase of the project.

Each participant in the process needs to reach beyond the perspective of individual and departmental needs to a full understanding and appreciation for group and institution-wide needs. This, of course, is one of the ways in which consensus is achieved. Broadening the focus of all concerned so that they are acting and making decisions for the good of the institution, rather than to promote their own best interests, is a necessary ingredient in selecting the right system. Happily, if this is presented in the right way, people will almost always rise to the occasion.

The point of the selection process is not just to make a specific choice, but to efficiently gather as much information as possible, both objective and subjective, for as many people as possible. There should be no effort to cut corners or to abbreviate the process in any way. For instance, some institutions choose to limit the number of vendors they will send their RFP to, thinking that to send it to all is just a waste of time. But the information that emerges out of this process is invaluable, especially during the implementation, including being aware of the wide range of quality and fitness in the various choices. No system is perfect, but one can take great heart in knowing that the system you're trying to implement is among the best available, especially when the burden of implementation gets to be overwhelming (as it does occasionally).

Broadening the focus of all concerned so that they are acting and making decisions for the good of the institution, rather than to promote their own best interests, is a necessary ingredient in selecting the right system.

The selection process requires studying the needs of an institution and assessing the vendors' offerings relative to those needs. But perhaps more importantly, the process should involve building a sense of ownership of the conversion project among everyone involved. The best way to do that is to make sure the process provides both for involvement by a lot of people and the dissemination of as much information as possible.

The selection process should be finite and results-oriented, driven by a realistic schedule. While the process should not be abbreviated, that is not to say that it should stretch out endlessly. The process should be structured, with milestones and goals along the way, and a clear set of expectations up front about who is to do what.

The basic process is simple: it should begin with the formation of a representative task force, continue with a thorough needs analysis leading to a document that will serve as the basis for a request for proposals from all software vendors that serve higher education. The task force, using objective criteria to consider the responses received, should then winnow down the number of possibilities to two or three that seem to be the best fit, then invite those vendors to give a scripted demonstration (with the script developed by the task force) for campus viewing. Other information gathering should occur at the same time, such as making peer-to-peer reference calls and doing site visits. At this point, the task force members will have all the information they need to make a good decision about which system to recommend to the institution's decision-makers.

None of this is very hard or complicated, but it is very important work. If done well, it will result in a well constructed building block in the institution's infrastructure. ■

CAUSE and Educom to

Two of the nation's leading higher education information technology and resource management associations have announced their intent to join forces and create a new organization.

The boards of directors of CAUSE and Educom indicate that the missions and programs that have been pursued individually by the two groups will be much stronger with the formation of a new association.

CAUSE is the association for managing and using information resources and technology in higher education, with members from 1,400 colleges and universities and more than 80 corporations. Educom, which is also a non-profit consortium of colleges, universities, and other organizations, is an association dedicated to the transformation of higher education through the application of information technologies. In addition to its 600 academic members, it has nearly 100 corporate associates.

In a June 18 meeting in Boston, eight representatives of the two boards, along with CEOs Jane Ryland and Bob Heterick, examined the potential elements of a new organization and outlined procedural requirements. All expressed enthusiasm about the prospect, noting the strong convergence of professional interests within the higher education information resources arena in requirements for leadership, support, professional development, policy action, and specific initiatives. The CAUSE Board had already discussed this convergence in its spring 1997 meeting, and remarked on the evidence of common interests shown by the extensive interest among organizations in establishing affiliate relationships with CAUSE.

One of the major inducements for the merger of efforts was how well the programs of the two organizations complement each other. Educom President Robert Heterick observed that "continuing maturation of the information technologies has greatly diminished the differences between administrative and academic computing, the original reason for two separate organizations, and the rise of networking has amplified the transformational potential of information resources throughout every nook and cranny of the higher education enterprise."

According to CAUSE President Jane Ryland, "CAUSE has developed great strength in member services and professional development through its management institutes and regional conferences, while Educom is well known in Washington policy circles through its advocacy roles featured in the Networking and Telecommunications Task Force (NTTF) and the National Learning Infrastructure Initiative (NLII)."

Tne two organizations have worked closely for more than a decade and among their many joint projects was the formation (with the Association of Research Libraries) of the Coalition for Networked Information (CNI). The activities and governance of CNI will be unaffected by this action.

Duane Webster, executive director of the Association of Research Libraries, said the library community welcomes the consolidation. "We have worked closely with both CAUSE and Educom for over a decade and this move should further strengthen our joint abilities to serve higher education through the leveraging of information resources."

If all goes as planned, the two organizations plan to begin operating under the aegis of a new corporation on or about January 1, 1998. A letter of intent has been developed (see insert) to explain the objectives to CAUSE and Educom members, along with a prospectus stating the principles that would govern an implementation strategy in the broad areas of function (programming and staffing), governance and structure (management, membership, bylaws), and financials (dues structure and financial health). The new organization would be based in Colorado, with a national advocacy office in Washington, DC, and a new president would replace Ryland and Heterick, both of whom had already notified their boards of their intent to retire in the near future.

"Even though the idea felt appropriate when it was first raised, we were surprised at how smoothly many pieces fell into place when we started talking," said Ryland. "Clearly, both associations have changed enough over the years that their common elements have the potential to merge relatively easily while their unique features are very complementary. We have a lot of details to work out, but this is a very exciting prospect."

Members will engage in a six-month dialogue regarding the issues of forming a new corporation and operating jointly. Complete and formal dissolution of the two existing corporations is likely to take at least 18 months in order to meet applicable state and federal legal requirements.

This article is based on information made available by both CAUSE and Educom, including a joint press release.

reate New Organization

The boards of the two organizations have formed a committee to guide the process of providing the current members with a prospectus of the new organization and to facilitate the comment period for member input.

Susan Foster, chair of the CAUSE board, noted that "this has been a long time coming, but the time seems absolutely right to take the lead from our institutions which have already begun to consolidate IT resources on their campuses. We expect the response from CAUSE members to be very favorable as many of them have been encouraging this action for several years. We hope to hear from as many of our members as possible during the next six months to make sure their concerns are included in the discussions."

Don Riley, chair of the Educom board of trustees, sees the merger as an opportunity to model the new organization after what many have preached about the transforming power of technology and the need to rethink organizational models. "This merger has the likely additional pleasant side effect of increased efficiency and effectiveness, with cost containment possibilities. Both organizations are strong financially, with sufficient reserves to cover the expenses associated with dissolution and creation of a new corporation. The two boards have agreed that this transition should occur in a way that is both revenue-neutral and dues-neutral."

July 15, 1997

The Boards of CAUSE and Educom do hereby express their intent to join together to create a new corporation to serve the interests of information resources in higher education.

The boards of each corporation have discussed the benefits of such a new organization both separately and jointly and believe that the benefits to our members and to the higher education community in general are both manifest and compelling. They include:

- the synergy and better service to the higher education information technology and resources community created by leveraging and strengthening the complementarity of the two programs,
- the ability to speak with a single and more forceful voice on issues of policy at the intersection of higher education and information technology, and
- the operational efficiencies that will result from scale economies and the elimination of unnecessary duplication of efforts.

Each board has appointed a committee to work with the presidents of the organizations to guide this effort. A six-month period open for member comment will conclude on December 31, 1997, and absent compelling reasons to the contrary discovered during that period, it is the intention of the two boards to transfer as much of their individual activities to a new corporation as possible and to begin the orderly dissolution of the existing corporations consistent with good management practices and applicable state and federal law.

Both corporations maintain sufficient reserves so as to make this merging of missions possible at no aggregate additional cost to the members.

Others in the higher education community have expressed support for the formation of the new organization. "As a long time participant in the affairs of both organizations, I am very pleased to hear they have decided to merge," said David Roselle, president of the University of Delaware. "I suspect my presidential colleagues in the 1,500 institutions in the combined membership of these two fine organizations will be equally as pleased."

Eugene Tobin, president of Hamilton College in New York, echoed those sentiments: "CAUSE and Educom serve an incredible range and diversity of institutions—ranging from research universities through comprehensive and liberal arts colleges to two-year and community colleges. This merger should provide the springboard to serve them all with an even stronger and broader range of programs."

Corporate affiliates of both organizations are also very positive about the benefits of merging into a new corporation to serve all aspects of information technology in higher education.

Note: More about the formation of the new organization is at the site: www.cause.org/admin/neworg.html, where there is also an opportunity to subscribe to a discussion list. ■

Redefining IT Support Groups—Again

At many colleges and universities, technology support groups are finding that they once again have to redefine their role. The first transformation took place several years ago, in moving from "data processing" support, where the support group was quite isolated from the end users, to a more service-oriented posture. Now, technology support groups are beginning to move from that service role to a partnership with their users.

This process is being accelerated both by modern administrative software products, which allow users to play a much more active role in running the information system, and by the need to take a team approach to making faculty comfortable and adept with classroom technology. The transformation can be both liberating and overwhelming for the users, and no less so for the support people.

For IT groups, service usually has been characterized by standing ready to fulfill requests: "Package it up and send it our way and we'll handle it (at least eventually)." The model here is the full-service laundry—the user hands over what needs to be done, the service provider does it and hands it back. Service is what was provided back when the administrative support people were called "programmers." They crafted the programs, made changes as requested, and sometimes helped the users figure out how to work with the program's screens.

We're also seeing the full-service laundry at work in developing classroom technology when the faculty member "drives by" with his or her educational objective and leaves it off with the multimedia development folks. Service sounds like a very worthy thing, but it doesn't really match the current situation very well. A modern information technology environment is not a full-service laundry.

Active control and involvement, as provided by modern technology, needs to be in the hands of the users. Administrative users define their own codes, run their own processes, create their own queries and reports. Academic users weave their teaching objectives into the use of the tools themselves. With all this power in the hands of the users, it is easy to fall into the belief that the computer center's role is neatly—and only—on the technical side of the line. For administrative users, for example, it's get the system up and running, write the basic reports, and teach the users how to tap into the data. "The users are the experts in their fields—we can't advise them how to use the system. That's their responsibility, not ours." For academic users, it's a similar approach: "We'll supply the multimedia software and teach Professor X how to use it; all he needs to do is to tell us what he wants."

Service sounds like a very worthy thing, but it doesn't really match the current situation very well. A modern information technology environment is not a full-service laundry. Active control and involvement, as provided by modern technology, needs to be in the hands of the users.

The problem is that the "we're just providing a service" approach, although light years better than being isolated form the users, leaves a major gap. To work effectively in a modern information technology environment, there needs to be a partnership, a joining of skills. Today we expect users to learn a good bit about the technical side of their data and their systems, and similarly we should expect the support staff to learn a good bit about the business practices and educational missions of the user departments. Each side can't just pass off tasks and responsibilities to the other; they need to work together—as collaborators and as partners—to make the best use of what's available.

Report writing in administrative systems is a good example of why partnership is important. Although some extraordinary users, both administrators and faculty, will get just what they want from the information system without any help, most users will need some sort of assistance. Often the kind of support they need is not just in mastering the technicalities of querying or in understanding the data structure, but in translating their goals into practical terms. That calls for the technical people to attempt to master and get involved in the subject matter that their users are responsible for, whether it be accounting, transcripts, financial aid, pledges, or research grant management.

Still-often-heard but no-longer-appropriate phrases include, "I'll be glad to help them write that report, just as soon as they figure out what it is that they really want"; "I wrote that report just the way they said they wanted it, but by the time the users saw it, they had changed their minds"; and "The users are really going to have to

learn the query commands and the names of the data elements—we can't be writing all their reports for them."

Alternatively, phrases typical of the new support model include: "Why don't we sit down together some afternoon so you can show me what you do with these documents when they come into your office?" "Would this kind of information help you in making decisions in your area?" "There's a process in the system that might make it easier for you to do that. Would you like to sit down together and see if it matches your needs?" This kind of customer orientation is vital in achieving the right kind of partnership with end users.

When it comes to supporting the faculty, partnership is equally valuable. Again, there will be stars among the faculty who know just what technological marvels they want to achieve in a course and slog through the manuals by themselves until they get it done. But many faculty will need help bridging the gap between their ideas and the realm of what-is-possible. A workshop in html tags or authoring language commands probably won't bear much fruit for these faculty at first. They need a good friend and ally who will sit knee-to-knee with them and try to understand what lies at the heart of their course. They need someone who can match the right tool with their ideas, and they need that friend to be around later when they start delving into the chosen tool and the technology doesn't cooperate.

If you are a computer support professional with a traditional technical background, how do you enhance your ability to form partnerships with faculty? Offer to pay a visit to an academic department during their department meeting; learn about instructional technology projects that are taking place on other campuses; attend conferences and workshops on academic uses of computing, perhaps together with a faculty member; hang out in the campus library—many librarians work closely with faculty and form an important third leg in the support partnership.

The nature of IT support for end users is changing everywhere. As the users themselves change and as the technology becomes more sophisticated and more useful, IT support staff need to become consultants rather than programmers, system integrators rather than system creators, and partners rather than servants. ■

"We will fumble a huge opportunity for academic renewal and crisis evasion if we respond to the knowledge media in our usual academic way. That is, by letting individual faculty members or their departments do their own thing. We need universitywide technology strategies. Why? Because the laissez-faire approach, far from enhancing a university's competitive advantage by giving it cost advantage and valuable distinctiveness, is likely to increase costs and create excessive differentiation that students will find burdensome.... Technology *can* raise productivity, but only through a reorganization of the teaching-learning process based on the development of a technology infrastructure."

Sir John Daniel
Open University
"Why Universities Need Technology Strategies"
Change
July/August 1997

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In Future Issues

- *Is the merger of computing and the library a good idea?*
- *Ten questions for the president to ask the head of IT*
- *Gary, that wasn't a machine that beat you*

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EDUTECH RESPONDS

Q. We're caught up in the best-of-breed versus fully-integrated-system discussion (argument?) in our administrative system selection. Can you sum up the basic points for us?

A. *The integrated packages available today, for the most part, allow campuses to define data elements and processes, enter and maintain data, carry out essential functions, get basic reports, and link data together through a consistent campus-wide approach and interface. Best-of-breed encourages each major department at the institution to choose the software that is best for it, which has obvious advantages for each department, but it leaves the job of data integration up to the in-house technical staff. The central question is whether integration (which everyone agrees is essential to the proper administration of every college) will be provided by the software vendor that has created a fully integrated package or by the in-house computing staff working with software packages from several different vendors. This is not dissimilar to the build-versus-buy decision for the software itself. If it makes sense to purchase software rather than develop it in-house, then, at least in most cases, it probably also makes sense to have the data integration provided by the vendor as well.*

Q. We are trying to plan for IT, but we keep butting our heads up against the same questions over and over: Where will the money for information technology come from? How can we get to the point where everyone on campus has the computer he or she needs to have? How can we replace hardware as often as it needs to be replaced? How can we ever have enough staff to meet the demand?

A. *We're certainly not getting any more public money and grants are harder than ever to find, so in many, if not most, cases, we're saying we just need to bite the bullet and re-allocate existing institutional funds. Of course, there is just about nothing harder to do. Even those on campus who are clamoring for more technology resources are loathe to identify areas that could be cut to provide the needed technology funding. This is where the importance of institutional planning comes in; an institution that has identified its values and its priorities will also, therefore, have identified how to use its resources.*

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EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

Gary, That Wasn't A Machine That Beat You

Howard Strauss, Princeton University

In the spring of this year, an IBM computer named Deep Blue played a six-game chess match with Gary Kasparov, a chess grandmaster believed by many to be not only the best chess player in the world today, but the best chess player that has ever lived. Gary won the first game, as nearly everyone expected he would. Afterwards he said that he had expected Deep Blue to play like a computer, and that's just what he thought it did. But in the second game during a crucial play, Deep Blue astounded most chess aficionados, including Kasparov himself, by making a move that no one expected and that turned out to be brilliant chess. Kasparov lost that game and, rattled by Deep Blue's human-like play, went on to lose the series.

After Game Two and again after the match, Kasparov was beside himself. There was something strange and unnerving about Deep Blue. It was playing chess like a person, not like the giant unthinking amalgamation of silicon and copper that it is. Kasparov wanted to see the printouts of how it reasoned. He needed to know how this Deep Blue machine "thought." When he plays against human opponents he is able to quickly psych them out and exploit their vulnerabilities. He used to be able to do that with computers too—until this enigmatic version of Deep Blue that seemed to transcend its mechanical ancestry.

IT Doesn't Play Chess

Perhaps you're thinking that this is an interesting story, but one you'd expect to see in *Wired* or on IBM's Web site. The last you checked, your IT department wasn't turning out chess-playing programs. Most people would rather be able to get their budgets balanced than to play games with a supercomputer.

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"It is dangerous to assert—or assume—that the brave new world is here, and that all information is now on line, free, and easy to use. When anyone says such things, legislators, university presidents, and others hear them, believe them, and want to act on them. The result could be disastrous for higher education, robbing researchers of resources they need and impoverishing all of those who depend on future breakthroughs in scholarship."

William Miller
Association of College and Research Libraries
"Troubling Myths About On-Line Information"
Chronicle of Higher Education
August 1, 1997

NEWSBRIEFS

WINNERS OF THIS YEAR'S EDUCOM MEDALS

Educom, the nonprofit consortium of higher education institutions that facilitates the introduction, use, and access to and management of information resources in teaching, learning, scholarship, and research, has announced that six individuals have been named winners of the 1997 Educom Medal. The winners, who will be recognized at the Educom Medal Awards Ceremony on October 29 in Minneapolis, Minnesota, were nominated by this year's partner societies for their contribution to the improvement of undergraduate education through the use and dissemination of information technology. They are the team of Dr. Jon Barwise of **Indiana University** and Dr. John Etchemendy of **Stanford University** (nominated by the American Philosophical Association); Dr. Jerry Goldman of **Northwestern University** (nominated by the American Political Science Association); Dr. Michelle N. Lamberson of the **University of British Columbia** (nominated by the Geological Society of America); and the team of Dr. Dawn M. Tilbury of the **University of Michigan at Ann Arbor** and Dr. William C. Messner of **Carnegie Mellon University** (nominated by the American Society of Mechanical Engineers).

For more information on the Educom Medal Awards Program, or to find out how your academic disciplinary society can become involved, see the Educom Web site at http://www.educom.edu/web/medal/medalHome.html.

CAUSE/EDUCOM PROSPECTUS

A prospectus outlining the proposed consolidation of CAUSE and Educom (see our last month's newsletter) is now available on the CAUSE Web site. Also on-line are questions and answers about the potential merger. Both sites are available through the CAUSE/Educom Discussions page at: http://www.cause.org/admin/neworg.html.

Members of either organization can also be a part of the ongoing discussion by subscribing to the NEWORG discussion group. Information on subscribing to the group or accessing the current archives is also available at the CAUSE/Educom Discussions page. Questions or comments about the proposed merger can be offered by either joining the NEWORG discussion group or contacting CAUSE directly at info@cause.org.

LIST DEVOTED TO ON-LINE TEACHING

OCC-L, the On-Line College Classroom List, is devoted to discussions, announcements, and papers that are pertinent to those who are teaching (or who are planning to teach) college classes on-line. The emphasis is on both the practical considerations of planning and implementing on-line instruction as well as on theoretical and philosophical issues. Discussions are aimed at the needs of both the beginner and the expert.

To subscribe to this list, send an e-mail message to: listproc@hawaii.edu and type the following into the body of your message: SUBSCRIBE OCC-L PutYourFirstNameHere PutYourLastNameHere.

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The Case of the Troubled CIO

Stephen sat in his chair, reflecting on the meeting he had just come from. His heart was still pounding wildly, and the thoughts going through his mind ranged from fear to anger to guilt to depression. How had things gotten so bad, he wondered. How could it be that the president, who had hired Stephen as Bolton College's CIO just eighteen months ago, seemed to lose faith in him this fast? Was Stephen really as close to losing his job as it felt at this moment?

It was true that the installation of the new administrative information system was going badly. But there were many reasons for this, and all of them were intertwined and complex. No one seemed to want to hear the reasons, though; they were all too busy looking for a scapegoat, and I'm it, thought Stephen.

As he sat there, he re-read the memo from the Registrar to the president that had precipitated the current crisis. Ordinarily a reasonable man, the Registrar had written a highly emotional, panic-laden letter that boiled down to one essential point: the students of Bolton College were not going to be able to register for classes next month for the fall semester. It was abundantly clear to him that the new system would not be ready in time, and, because everyone in the Registrar's office had spent all of their time for the last three months getting ready to switch to the new system, none of the regular preparation work had been done for the old system, rendering it completely useless at this point. Hence, the Registrar graphically portrayed, the buildings of Bolton would be empty of students come September. Not a pretty picture.

All the drama aside, however, Stephen realized that the Registrar had been right to alert the president. In fact, the new system was not likely to be ready for registration by next month. There was so much left to be done, and everything was taking much longer than they had planned. There were still some bugs in the system, and while they seemed to be relatively minor, they were troublesome enough to have disrupted user training on the new modules. Also, the report writer they had purchased from a third-party vendor wasn't working correctly, so some critical reports that they were depending on that were not included in the baseline software package were not written yet.

It was true that the installation of the new administrative information system was going badly. But there were many reasons for this, and all of them were intertwined and complex.

But perhaps most important, and the thing that was really bugging the top administration—especially the financial vice president—was that they were all working with the expectation that when registration actually happened, they would be able to get by with fewer people to do the job than the old, very manual, very labor-intensive system required. In fact, one of the ways the large sticker price of the software had been justified was by citing expected staff reductions in the Registrar's office. Stephen had tried to argue otherwise, of course; any IT veteran would have done the same. But the arguments fell on deaf ears. The administration believed what it wanted to believe, the software vendor suggested strongly (without ever saying it in so many words) that they were right, and even the Registrar himself was looking at the new system as a way of "cleaning out some dead wood." But it sure wasn't working out that way.

It was very clear now to everyone that not only would they not be able to reduce staff, but in order to have any chance at all of getting through this registration successfully, they were going to have to hire additional people, both in Stephen's office and in the Registrar's office. Even if they were just temporary hires, the whole idea was an outrage to the administration. Stephen also realized that suggesting that some of them may be needed even after the crisis passes was unthinkable at this point.

And, as the president angrily pointed out, if the administration was upset at the idea of additional people, think how the faculty were going to handle it once they found out! This after eliminating faculty positions in six departments just last spring! And the faculty already thought this whole project was just a big waste of resources.

No, thought Stephen, it's not fair. I'm getting hung out to dry over something that isn't my fault. The expectations were unrealistic to begin with, about both the staffing issue and how hard it is to implement these kinds of big software projects. The problem is how to get this back on track and restore the president's faith in me. ■

Note: *If you would like to respond to this case, just send us e-mail at cio_case@edutech-int.com.*

Gary, That Wasn't A Machine That Beat You...

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On the other hand, your IT staff is concerned with building human-computer interfaces. They understand that a bad interface to a machine can make even a good program problematic for users. IT folks know that a user's entire view of a system is seen through its interface. If the interface is intuitive and natural, users can get their work done better. But it is also true that interacting with a machine is unnatural and fraught with many limitations.

Chances are that Kasparov would never accuse any of your institution's IT systems of being too human-like or of not behaving as computers ought to. Neither would your users. That's too bad because that's one area where IT folks could learn quite a bit from Deep Blue. Gary Kasparov got a glimpse of the fact that he was not playing chess with a machine at all. He was playing against the system designers, project mangers, programmers, interface experts, and the host of people who were involved in selecting the hardware and creating the software for Deep Blue. Your users don't really communicate with a computer either. Instead, they use a computer to communicate with a group that is functionally very similar to the folks who built Deep Blue.

In previous chess-playing programs, including earlier versions of Deep Blue, software designers had done such a bad job that they completely hid the fact that their systems were designed by humans, much like the systems you give to your users. In playing against Deep Blue in the past, it was obvious that one was interacting with a machine. Despite a prolonged effort that began back in 1985 to design the best chess-playing program, by 1996 when Kasparov last defeated it, Deep Blue still seemed to be a lumbering mechanical beast.

One way that IBM changed that was to add a full-time chess grandmaster to its Deep Blue team and a few more as consultants. Previously it just had the best programmers and some pretty good chess players assigned to the team. It seems unbelievable that IBM thought it could get Deep Blue to play grandmaster-level chess without having a grandmaster working with its IT development team. Your IT development teams certainly include users who are the experts in the systems you are building, don't they?

> *Gary Kasparov's discomfort in having Deep Blue play like a human was because it was easier for him to deal with a machine than a person. For IT users, just the opposite is true.*

Ones And Zeroes

You know that computers can't think like humans; even their ability to process letters of the alphabet is done by sleight of hand. Everything inside a computer is just a nearly endless string of binary digits that can be processed at incomprehensible speeds.

When a computer chirps and displays "Error 1456 - restart" it is not because this is the strange way computers think or communicate with humans. This is the way some human has decided to use a computer to communicate with you. It isn't a machine saying "Error 1456 - restart" to you; it is a talented, highly paid person employed by you or some software company that is talking to you like that. No one would tolerate an employee that talked like that in a meeting, but we tolerate it when an employee gets a computer to say it for her. Software never communicates with us—humans do.

Gary Kasparov's discomfort in having Deep Blue play like a human was because it was easier for him to deal with a machine than a person. For IT users, just the opposite is true. Gary is trying to beat the program he is playing so the dumber it behaves the more likely he is to succeed. IT users are trying to get their work done, and communicating with a dumb machine, while it is something they have come to expect, just makes their lives more difficult.

Old Time Telephones

When telephones first came into use, they had an interface that made it clear that interactions were with humans, not some faceless phone network. To call someone you would: 1) pick up the receiver and place it near your ear, 2) turn the crank to alert the operator, and 3) say something like, "I need to talk to Pat down at the mill." That was it. You'd be connected.

The phone was clearly just a tool that got in your way as little as possible. But as the volume of calls grew, it soon became too costly to have a human connect each call. When the system was automated the designers chose to have users

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adapt to the primitive hardware rather than make the hardware adapt to humans. The human-to-human interface was replaced with a crude human-to-machine interface. No longer could one call Pat down at the mill. Now one needed to remember that Pat was 6843 and Sue was 8647. Four-digit numbers were rapidly replaced by seven-digit numbers, then numbers of eleven digits or more.

Having started down the road to make humans deal with zillions of long numbers—something humans are notoriously bad at—there was no stopping the erroneous notion that using a phone was an interaction between humans and machines. When an area code threatens to fill up, it is split into two. Once you can finally almost remember that Pat's phone number is (808) 545-6543, then half of the 808 people are moved to the 484 area code. Has Pat's code changed? Who can keep track? If we realized that all interactions with today's hardware and software are actually between sensate humans, we would never design or tolerate such a horrible interface.

The first solution to this bad interface was to provide speed-dialing lists. Since eleven-digit numbers that changed every few years are more than mortals can deal with, the phone system itself is used to translate a two-digit number into the eleven-digit number the system needs. And when an area code changes, one only has to recode the number once then continue to use the same speed dialing code.

What is replacing this still creaky interface? Voice-activated dialing. How does that work? 1) Pick up the receiver and place it near your ear and 2) say something like, "Call Pat." This is a slightly better interface than the one we started with. You no longer have to turn the crank.

New Ways to Talk to Machines. In the July 1997 issue of *Byte* magazine, an article highlights the new "NUI"—Network-centric User Interface. If it is a user interface how can it be network-centric? It should be user-centric, but a glance at it makes it clear that it is correctly named. One wonderful feature of this interface is the increasingly popular "scrolling marquee." This is surely just the way you'd like to read announcements or news. You get to see about six words that move by your eyes at a rate set by the designers, the network speed, and the peculiarities of your hardware. Is this the way you'd interact with a human? Sure, we've all seen stock tickers and they no doubt solved some pressing problem. But we never interact with them; we just let them run and do the best we can to glean some information from them. But our modern designers have taken this interface that was wretched for viewing stocks and are using it for news, announcements, and other things for which it is even less well suited.

Only when the Deep Blue team included chess grandmasters was it possible to make the system seem to be human. While this was dismaying to Kasparov, it will be Nirvana to your users.

Building A Better Mousetrap – To get our systems to have more nearly human—not machine—interfaces we must change the very premise upon which we design systems. The first questions that need to be asked are of the sort, "How would our users do this if they were interacting with humans instead of with machines?" The fact is that they *really are* interacting with humans, something the designers must eventually realize. But which humans are they interacting with? Not the systems staff with whom they may share no common experiences (or even vocabulary). They are interacting with the service providers that manage the functions and data that the users will use the system to access. The challenge to your system designers is to create a system that will allow your users to interact with these service providers and their data without the service providers being around. Interface designers must stop building interfaces to computers and realize that they must build interfaces to humans. This requires that system designers have a deep understanding of both the users and their service providers to code a bridge between them.

Only when the Deep Blue team included chess grandmasters (in this unusual case they were both the users and the service providers) was it possible to make the system seem to be human. While this was dismaying to Kasparov, it will be Nirvana to your users. (Well, at least they'll be happier and more effective.)

Imagine your users wanted to keep track of their stocks. How would they do it without a computer? They'd visit their stockbroker and say "How's my portfolio doing?" or "How's the market today?" or "Is this the time to buy gold?" Your users would never say to their bro-

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ker, "Give me the last trading price of every single stock in the order they are traded and keep me updated continuously." And their broker would never say, "Here's the reference manual. Once you've studied it you'll know how to ask me questions."

Follow The Knowledge

In any interaction involving humans there is a distribution of knowledge. There are things users know, things the service providers know, and things that are common knowledge. Common knowledge is information that doesn't have to be exchanged, making it good practice to use wherever possible. Common knowledge includes the interaction protocols and the common vocabulary. Is it OK to ask a user to specify the P/E of potential stock purchases? Is double clicking a mouse something a user knows how to do? In the context of a user-to-stockbroker relationship, do both sides understand what a portfolio is? Does a user know that a phrase underlined in blue is a hypertext link?

Since a good interface uses common knowledge, it is critical that designers understand the rules and never violate them. There are Web pages that contain underlined blue text that is not a hypertext link; it is just underlined blue text. I have clicked away at this stuff convinced that the network was slow before realizing that the designer just liked underlined text. A good designer would never use underlined text in any context where hypertext links are possible—except for that purpose.

Beyond leveraging common knowledge, it is important to take advantage of the knowledge the user has. In every interaction among humans, a growing collection of information is shared and saved by all the parties involved. A good IT system will do that too. The information gathered might change, but then only the changes need to be dealt with.

After a short time, a good stockbroker knows the securities in each user's portfolio. A user could figure out the value of his portfolio by staring at a ticker tape, but he likely doesn't want to see all those stock symbols cruising by, he just wants the value of the twelve stocks he owns. A good system or stockbroker would know the number of shares of each security, their cost to the user, and their latest prices. Instead of seeing prices of all stocks, a user could view the market as though it consisted of only the securities he owned.

The truth is that no affordable broker would be willing to give you the value of your portfolio and examine "what-if" scenarios as often as you'd like. But if you had a system that connected you to the knowledge of your broker and to the data that she could access on your behalf, you'd be close to having your own dedicated broker.

That is the promise of user-centric systems that have human, not machine, interfaces. Instead of making it seem like you have your own desktop, file cabinets, or network, it appears that you have your own private accountants, tax analysts, mathematicians, counselors, and so forth. Your computer connects you to the knowledge that the specialists have in their brains and the data that they control.

Talk And Chalk

It has been said that if venerable old Ben Franklin were to appear today and visit various twentieth-century places he'd be baffled and amazed. Watching open-heart surgery, for example, he'd have no idea of what was going on. At an airport he'd be totally clueless. He'd even be helpless in a supermarket. But if Ben walked into most of today's college classrooms, and saw a professor at a blackboard, chalk in hand, he would immediately and completely understand what was happening.

Usually this tale is told to illustrate how technology has largely passed over education, but it also illustrates that evolution has not changed humans in the short time since Franklin lived. "Talk and chalk" was a human interface that worked just fine in Franklin's day, and it still turns out to be an excellent model for human-to-human interaction—even when there is a computer in the middle.

In designing a new system it would be helpful to consider the computer as a window to a professor in front of a blackboard. Naturally in this scenario a user would be the only student in the class, so he or she would have the professor's undivided attention. The professor could also call on his colleagues for their expertise. Colleagues would include historical figures and other folks, past, present, future, and imaginary. The blackboard would be special in that the professor could draw beautiful customized charts and graphs in millions of colors on it in a fraction of a second as well as displaying animations, film clips, and whatever was necessary to help the student understand the material. The knowledge and data would come from the professor—the service provider. Technology would just provide the professor with the tools to help a student manage and understand the data.

EP, Where Are You?

What are some of the characteristics of the electronic professor (EP)

that are often missing in computer interfaces? The EP knows something about each user. An EP doesn't treat each user the same. And it learns about the way each user prefers to do things.

An EP is proactive. It watches what is being done and makes helpful suggestions. It ignores and understands simple mistakes. If it isn't sure about what is meant, it doesn't say, "Error 1456. Retry." No human would do that. Instead it might say, "I don't understand. Are you trying to delete an entire row or change it?" "Error 1456. Retry" suggests that a user has done something wrong. A good EP knows that users are always learning and that it is there to help, not chastise.

An EP not only knows the common knowledge for a given context, and something about the user it is working with (not working for), it also has a world view. If I try to do something a system is not designed to do, most will just tell me that they can't do what I've asked. (Of course some will just say, "Error 1456. Retry.") That is not the way a human would react. A human would point to some source that could either handle the request or who would know where to go to handle the task. A system with a world view is aware that there are systems beyond itself and it also knows something about them. It knows what it can do (and will tell you if you ask) and knows how that fits in with the broadest tasks of the university.

An EP communicates in natural language when that is the best way to get things done, but also allows standard notations (e.g., Boolean searches, equations, chemical symbols). And like a one-on-one session with a professor, an EP session is very interactive.

It is not essential that an EP actually have some embodiment on the screen such as anthropomorphic critters. What these critters do for a help system is actually a bold step in the right direction, although actually having the critters roll their eyes, bark, and do cute things is something many users would prefer to live without.

It may be too early technologically to really put all the experts in a computer bottle and draw on them at will, but our inability to make systems everything we want should not deter us from moving in the right direction. That direction is to build systems with interfaces that connect our users to the expertise of others and the data they can access, not just to machines. You'll know when you've arrived there when your help desk gets a call from a user who says, "There's something strange about this budget program. It seems to understand what I'm trying to do and is actually trying to help me. I don't know how to deal with this." You might not understand such a call, but Gary Kasparov would. ■

"I'm seeing my students' attention spans wane and their ability to reason for themselves decline. I wish that the university's computer system would crash for a day, so that I could encourage them to go outside, sit under a tree, and read a really good book—from start to finish.... Knowledge does not emerge in a vacuum, but we do need silence and space for sustained thought. Next semester, I'm going to urge my students to turn off their glowing boxes and think, if only once in a while."

David Rothenberg
New Jersey Institute of Technology
"How the Web Destroys the Quality of Students' Research Papers"
Chronicle of Higher Education
August 15, 1997

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- *Is the merger of computing and the library a good idea?*
- *Unique characteristics of faculty IT support*

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EDUTECH RESPONDS

Q. Our college recently made a decision to discontinue the purchase of Macintosh computers for at least a year. This takes care of one part of our problem, but the other part is all our current Mac users, especially among the faculty, and whether we should continue to support them.

A. *Your decision not to purchase is a reasonable approach to a thorny issue facing many campuses that have made a heavy investment not just in Macintosh hardware and software, but in teaching materials and activities that rely on the Mac and in hours of learning on the part of faculty. The future of the Macintosh seems uncertain at best, although the education sector continues to be one of the Mac's chief areas of support in its recent role as niche technology. However, as you point out, the policy of not buying new Macs does not make the present investment go away. Your college should devise a strategy for continuing to support Mac elements in the academic program until they are suitably transferred to another technology. Even if it's true that identical or equivalent software already exists in the Windows arena, there should be a detailed plan for purchasing the new computers, peripherals, and software to replace the old ones, transferring data from one machine to another, and retraining faculty and students where needed.*

Q. We're looking at different budget models for technology and would like to know whether it is better to centralize all expenditures for desktop equipment or to parcel out the funds to departments and let them spend it any way they want to.

A. *Both are good models and both work well in many institutions in which they are used. The key is that there is no single answer that fits all institutions equally well, and you need to decide on a way of budgeting for technology that is consistent with the way you do other things. Keep a couple of things in mind, however: if you go the decentralized route, you'll want to establish standards within which the users need to stay, to ensure both compatibility and the efficiency of support services. And if you decide centralized is best, have the decisions about priorities for the use of your resources made by a representative committee, not by a single person.*

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EDUTECH REPORT

The Education Technology Newsletter for Faculty and Administrators

Hot Issues 1997–98

by Thomas Warger, Five Colleges

At the start of each academic year, we poll a sampling of our subscribers to ask what the hot issues are in information technology on campus. The survey was conducted this year during early September, with subscribers contacted by both phone and e-mail. Responses ranging from brief e-mail replies to lengthy phone conversations were provided by people ranging in function from IT management to deans and business officers. As in past years, most of the issues mentioned by respondents are not new, although some aspect of the comments received on all of them is particular to the current year.

Yes, the year 2000 problem is real enough and getting hotter as time ticks down. What were we thinking back when we imagined it to be important to save the resource consumed by two more digits? This year's survey of hot issues turned up a poignant sense that we are caught between old problems that are still pressing on us and a new set of challenges that very few even suspected just a few years ago.

It used to be about technology and systems; now it is about information environments. We still face substantial issues with the underlying "mechanics" of information technology—buying and installing hardware, learning new systems, meeting help requests, processing data—at the same time that the academic community is beginning to expect something as robust, complex, and "natural" as an ecosystem. Aren't growth, change, and adaptation things we can take for granted? Don't generations of technology succeed each other in the natural order of things? Shouldn't the sun rise on January 1, 2000 just as it has for as long as we can remember?

continued on page 3

"Many difficulties still confront scholars [trying to use technology]: problems of access to resources; shortage of equipment, skills, and support; difficulties of networking; and the challenges of converting materials into electronic form. All these areas require greater funding and coordination in order to bring about an overall improvement in humanities scholarship."

Pamela Pavliscak, Seamus Ross, and Charles Henry
"Information Technology In Humanities Scholarship"
American Council of Learned Societies
Occasional Paper #37

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NEWSBRIEFS

INFORMATION TECHNOLOGY IN THE HUMANITIES

The American Council on Learned Societies has announced that its recently published Occasional Paper No. 37, "Information Technology in Humanities Scholarship: Achievements, Prospects, and Challenges—The United States Focus," by Pamela Pavliscak, Seamus Ross, and Charles Henry is now available on-line at http://www.acls.org/op37.htm. The authors "present ... a selective view of current activities.... This overview is intended for scholars in the humanities who are not yet aware of what has been accomplished, as well as for those who direct and fund research and higher education." The report includes a background essay; a survey of work and achievements in a variety of media; a view of new developments; a look at what is needed to fully prepare faculty, researchers, and institutions to take full advantage of the electronic medium; and recommendations and follow-up activities.

For more information, contact ACLS, 228 East 45th Street, New York, New York 10017; (212) 697-1505; http://www.acls.org/.

CALL FOR PAPERS: COMPUTERS AND WRITING CONFERENCE

The 14th Computers and Writing Conference will be held in 1998 at the University of Florida on May 28–31 and will focus on "the distances transcended and/or foregrounded by the Internet-oriented writing classroom." Topics for the conference include: reconciling content and method in the networked classroom; inventing "practica" in sustaining distance professional relations; exploring the distances between the areas of study within English and Composition/Rhetoric; bridging social distances created by the migration on-line of educational institutions; theorizing the distances between technology, education, and policy formation; and rethinking the role(s) of computers and writing in network-based distance education.

Submissions can be made via the CW98 website (http://cw98.ufl.edu) or through e-mail to submissions@cw98.ufl.edu.

NEW ON-LINE SERVICE AT FLORIDA STATE

Florida State University is the first in the world to use a powerful new research service that puts millions of documents from newspapers, journals, and other research materials only a mouse click away for students, faculty, and staff. "UNIVerse" is the result of an alliance between FSU and Lexis-Nexis, the on-line information provider. The service is free to individual users on the FSU campus.

UNIVerse is available through FSU's internal network, with users able to access the service from their own personal computers as well as workstations found across campus. The Internet-based project is the culmination of two years of collaboration between FSU and Lexis-Nexis. The company developed the Web-based interface to its extensive database, while FSU provided help with beta testing in classrooms across campus and usability testing in its School of Information Studies. For more information, contact Frank Murphy at FSU, (904) 644-2466 or see http://www.fsu.com.

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Hot Issues: 1997–98...

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The year 2000. Campuses facing the date-handling problem have a hot issue. Fixing program code is only part of the problem: where administrative applications were already candidates for replacement the date issue has added unwelcome time pressure for what is already an arduous task. Time, cost, and specification are the three classic dimensions of project management. In the academic world we are inclined to lock the cost and specifications—and accept delay in delivery. But where the 2000 issue ties our hands with respect to project schedule we are very uncomfortable with the prospect of higher costs or reduced project ambitions. Getting administrative offices to buy into the realities of confronting this issue, sharing the responsibility, and realigning priorities to meet the urgency of getting it resolved has been a difficulty on many campuses.

Funding. Respondents at a cross-section of types of institutions report that they continue to lack adequate and regularized budget for IT. As one campus CIO remarked, "We have an installed base that has been established on end-of-year funds and one-time moneys." Even colleges and universities that have managed to fund ample equipment and infrastructure report being unprepared to carry the upgrade and replacement costs. Those who have never had the resources to acquire an adequate base feel even more worried about not being able to meet educational and operating objectives in the future. This year, there is special concern that budgets are not providing enough staff positions to cope with service demands. It is not an exaggeration to say that in just the past few years the counts of computers, servers, LANs, and computer users have grown by an order of magnitude, while support staff numbers have seen only small increments in most cases and even reductions in a few.

One comment suggested an even hotter issue lurking inside the perennial concerns about under-funding: that the discussion might have to focus on redistribution of funds to IT from other areas of the institution's budget.

It is not an exaggeration to say that in just the past few years the counts of computers, servers, LANs, and computer users have grown by an order of magnitude, while support staff numbers have seen only small increments in most cases and even reductions in a few.

Hiring/retaining IT staff. As one respondent put it, "We are fighting a losing battle with industry." As campuses come to depend on nearly 100% uptime for their networks, servers, and desktop equipment the need for first-quality staff grows sharper. The widespread practices of hiring predominantly at the entry level or tolerating performance levels that would not be acceptable in the commercial world are being reexamined critically. But colleges and universities are still unwilling or unable to pay anything like the prevailing wages in the commercial sector for staff. The institution-wide salary structures that have been developed in the past decade for staff employees are often cited by human resources offices as limits on how far they are willing to meet market rates in IT staff compensation. The total cost of staffing is also facing upward pressure from efforts to upgrade and retain staff by sending them out to commercially provided technical training.

Technical currency. Staying reasonably current in key and popular technologies is a frequently cited problem. Computer and LAN operating systems, browsers, e-mail clients, multimedia, and Java have greatly expanded the range of software to know and on which to keep up to date.

Update cycles and new product releases appear to be more frequent than ever, with no sign of slowing down. With the large increase in numbers of computer users on campus, the task of keeping the whole community at the same level for any of these categories of software is nearly impossible. Consequently, the community tends to straggle across several versions of any type of software or even several technologies for one function. Many campuses are struggling to reduce the variety of e-mail software, for example.

At some point the difficulty of staying current became a more worrisome issue. There appears to be a connection between the emerging expectation that computing be seamless and less tolerant of problems of compatibility, whether they are matters of inconvenience or

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Thomas Warger is Assistant Coordinator for Information Systems at Five Colleges, Inc. in Amherst, Massachusetts.

Responses to "The Case of the Troubled CIO"

Editor's note: Our last issue (August) contained a case study about a higher ed CIO faced with a potential disaster in the implementation of a new administrative information system. We received many responses to the case, and have selected four of the best ones for publication here. Our thanks to all who responded.

Russ Ellsworth
Director, MIS
Berkshire Community College

Stephen should have had the old resume out way back when the arguments about reducing staff were being made.

At my college (Berkshire Community College) we are implementing a new system, and trying very hard to "do everything right": involving users, laying out a reasonable time frame, spending money on training, etc. And of course, we may still not make it, but things are okay so far.

There are two problems that must be overcome with every such implementation. The first is that the management (above the CIO) must understand that the IT component of the project is not the issue. The issue is one of expectation and support. If the upper management is unwilling to tell the individual user departments that they are as much responsible for the whole thing working as is the IT department, then the IT department better get fitted with suits of armor. Permission must be given to flog whiny users who suddenly fall in love with the very systems they complained most loudly about prior to the new one.

The second is that no one should expect staff reductions EVER from any information technology. Any reductions due to any technology are usually short-lived. Consider a very simple case: In the "old days" our clothes were washed by basically beating the dirt out of them on rocks in a river. This was such a tedious task that "wash day" was just that, an entire day (say sixteen hours), probably every month. Because of this, people generally wore the same clothes day after day, until the pants walked by themselves and the sweat was so bad that the horses refused to take anybody anywhere other than the local rock-banging site at the river.

> *The CIO didn't prepare his people, and he obviously didn't build a sufficient safety margin into the implementation plan. Why should the president have faith in someone who plans that poorly?*

Now, we have that great technology, the Washing Machine. The average home owner spends at least sixteen hours a month washing clothes, so there has been no labor reduction. However, there is a general increase in what we get for those sixteen hours. We get clean clothes daily, rather than ones that must be bent as opposed to folded.

Similarly, the Registrar should not expect to reduce staff; students are going to start to expect more services from the same people (which is what Stephen probably tried to tell them when he spoke to "the deaf ears.") The only real solution is to bolt for industry where at least you can feel that you are being paid sufficiently to take the beatings that you're going to take anyway.

Kurt Corriher
Director of Computer Services
Catawba College

Sorry, but it IS Stephen's fault. A major component—THE major component—of a CIO's job is constantly educating, communicating, and preparing other administrators, staff, and faculty for the effects of IT changes. If everybody has inflated expectations, it's because the CIO didn't do his job. Too many of us lose ourselves in technical issues and forget that finding the answers to technical questions is the reason we have a technical staff. We should spend less time with programmers and technicians and a lot more time with administrators and users.

How can Stephen restore the president's faith in him? It's probably not possible at this point. He didn't prepare his people, and he obviously didn't build a sufficient safety margin into the implementation plan. Why should the president have faith in someone who plans that poorly?

Joe Komar
University of St. Thomas

Stephen should have done some things differently to avoid the current situation and can now do things to help dig out of the current situation.

Should have done:

The most important of the "should haves" is to develop a sense of joint ownership of the project among all of the major players. Obviously, being "too busy looking for a scapegoat" is a clear indication that there is a lack of widespread ownership.

It should be made clear from the very beginning that the system belongs to the institution and that everyone has a stake in its timely, accurate implementation. This should be an agenda item for the first day and one that is frequently revisited throughout the project. Buy-in by everyone should be explicit and reaffirmed frequently.

Some subtle ways of insuring joint ownership is to use the language carefully and purposefully. Frequent use of "we" and "our" goes a long way in setting the stage for mutual understanding. Finding fault should be avoided and should be replaced with joint problem solving. Separating the challenges from the players involved will certainly help.

Some good, sound project management techniques could also have helped. By hashing out a detailed schedule early in the project, those involved would have gained an appreciation for the complexity of the task. There could have been slack built in at the beginning just to accommodate Murphy's Law. Finally, contingency plans should have been made so that there were alternatives available should things go wrong.

Can do now:

Avoid getting into a "memo war" with the Registrar. What is needed is a direct, honest, no-bull discussion with the Registrar to first find out exactly what her fears are and then to start developing an action plan to address those fears.

Avoid saying "I told you so" about whether the project will save money or not. It is probably already clear to those involved that there is no money to be saved and rubbing their noses in it won't help.

"Blitz" the current registration problem by assigning additional staff, hiring where needed, and bringing in consultants to assist. Stephen must clearly demonstrate his understanding of the importance of registration to the institution. It must take place as scheduled and be successful.

> *The IT component of the project is not the issue. The issue is one of expectation and support. Permission must be given to flog whiny users who suddenly fall in love with the very systems they complained most loudly about prior to the new one.*

Once the registration problem is past, regroup and try to get that joint ownership that should have been there from the beginning.

Albert L. LeDuc
Athene Consultants, Inc.

This case study sounds extremely realistic, the reason so many people think CIO means "Career Is Over." Someone wise once said that three conditions all need to prevail for CIO success: The CIO must be extremely adept, technically and politically; the President must have a good and confident, trusting relationship with the CIO and vice versa; and the President must be technology-friendly. In this case, it is clear that the latter two conditions are not met; the President really is not being supportive, and, interestingly enough, his reasoning is absolutely correct.

The simple answer here is that there should have been more planning, and, truth be told, the CIO function as strategic and sometimes tactical planner may be its most valuable role. On the surface, Stephen is to be faulted for not having involved the institution in realistic planning.

Of course, saying that does not solve the problem, which may well be intractable as stated. My advice to Stephen would be to write three letters (old joke) and get ready to bail. The saddest part of this story is that Stephen's argument for prudence (perhaps for more testing, certainly for more time, and explicitly against staff reduction) "fell on deaf ears." The only way that is preventable is for the President to have understood the complexities, which doesn't often happen. Presidents are accustomed to trusting CFOs, because there is always a basic understanding of black and red ink, but CIOs are usually dealing with materials of an alien nature, but which nonetheless require very conservative management, (very much like the CFO).

At its present level of occupational maturity, the CIO everywhere is capable of great negative leverage but little positive leverage. The CIO position is a useful scapegoat for executive administration when things go wrong. Any defense Stephen has at this point will sound pretty awful. ■

Hot Issues: 1997–98...

continued from page 3

more substantial barriers to work. The pace and scope of change figures this year as a special concern among those surveyed.

Support crisis. Or as one person termed it, "client support meltdown." There is growing concern that staff shortages and skills deficits are causing more than just backlogs in service. Service organizations are in some cases coming perilously close to being viewed as ineffective and uncaring.

There are several factors at play here beyond the ratio of users to support staff, including that the pace of introduction for new technologies has increased. In addition, webpage authoring and multimedia development are examples of ambitions many users now have but cannot reasonably hope to fulfill with their limited technical backgrounds, thereby requiring additional technical support. And dorm networking has increased and dispersed the user base to an extent that traditional walk-in help desks are just not able to address.

An undercurrent in some of the comments appears to be the need for a new division of responsibility between users and support staff, with more self-sufficiency being the new norm. IT organizations are also realizing that this change requires them to back away from the pride they used to take in building their users' enthusiasm and expectations, as those now need to be tempered and restrained. A manager voiced one of the guilty secrets of academe: that a kind of class prejudice leads many faculty to resist seeing IT support staff as professional colleagues. If IT organizations are to reposition themselves as partners in the work of faculty (and administrators), this attitudinal problem will have to be addressed. There is some sense that the old role of provider of technical benefits is now less possible for IT organizations; they need instead to take a more limited and realistic part in assisting their clientele.

Focus on the classroom. We have come a long way from the (recent) day when a small handful of faculty used nothing more than a VCR or slide projector in class. Rooms equipped with multimedia and network capability are now in strong demand. A presentation workstation, high-quality projector, and sound system seems to be a standard classroom kit sought by increasing numbers of faculty, but rarely available yet in sufficient numbers. These classrooms are expensive to equip and problematic to maintain and support.

Most recognize that the faculty role is evolving away from the provision of information and toward coaching and guiding students through experiences where they bear more of the responsibility to discover information and organize their own explorations.

If there is a single force driving this interest, it would have to be the Web. Perhaps the most encouraging aspect of this issue is that there is growing evidence that many faculty are reaching the conclusion that they want and need to change their methods of instruction.

Distributed learning. In a related development, various forms of telecommunication (networked multimedia, video teleconferencing, the Web) are being tried by increasing numbers of faculty. "Distance learning" has been hot for several years now, but diverse alternatives to traditional classroom instruction are also attracting faculty interest. Most recognize that the faculty role is evolving away from the provision of information and toward coaching and guiding students through experiences in which the students bear more of the responsibility to discover information and organize their own explorations.

In a similar vein, initiatives in "collaborative learning" (faculty and students in various combinations) are under way even on campuses that concentrate on in-residence education and where the words "distance education" are seldom heard.

Security and legal obligations. Notwithstanding the recent overturning of the Communications Decency Act, there is concern over institutional needs to keep out destructive hackers and avoid liability for the actions of campus community members. Workshops on writing usage policy, figuring out what "fair use" means, and monitoring network traffic will be very hot this year.

As colleges and universities begin to rely on the network for delivery of services and administrative information, they are feeling more stringent requirements to assure secure communications. And as faculty and students become "publishers" of increasing amounts of information on the Web and net-

works, thorny questions of intellectual property rights and liabilities arise. The uncertainty and complexity of these issues are a cause of special concern and impatience among the people with whom we spoke.

Conclusions. Some of the more despairing or pessimistic comments we heard this year reflect a sense that information technology people and organizations are being pushed hard by events and by their users' expectations. A clear sub-theme in the responses is that expectations on campus have risen dramatically and out of proportion to the resources available to meet them. Assessments of how well organizations are doing in coping with the challenge range from very guarded optimism to much less sanguine views.

Several of our responders remarked that they had reached a degree of completion in campus infrastructure installation so that they could envision moving on to begin to exploit the capabilities of what they had built. For them the focus is shifting from technology to information, not because all the technological issues have been solved but because they have reached the threshold of making substantial changes possible in their institutions.

The most striking characteristic of the responses we had this year is that they cite a rapid increase in expectations on the parts of faculty and students. This change appears to be stronger than anticipated and broader based. The list of particular issues includes many that are familiar, but along with them is an indication that we are heading into a phase of consolidation, where emphasis is shifting from the view that information technology is primarily about providing new capabilities to one that instead highlights the impact that the campus community expects to see as a result.

It may be too soon to know whether a wider sense of ownership for information technology, one that would relieve some of the heavy pressure on IT support organizations is in the offing, but there is definitely more than a whiff of crisis in the air this fall. ■

"Often, brilliant new educational tools are developed that are unfortunately so far out of sync from the current target contextual infrastructure that they have no hope of being applied. Not every technological innovation, however cool it may be, is appropriate to the educational context. There must be careful and intelligent meshing of technological and educational agendas. Institutions must address IT issues coherently and make the necessary financial commitments to build a leading-edge networking infrastructure, with wired offices, classrooms, residence halls, and seamless off-campus access."

Mimi Recker
Victoria University of Wellington
"Appropriate Use of Educational Technologies:
A Layered Approach"
Educational Technology Review
Summer 1997

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In Future Issues

- *Is the merger of computing and the library a good idea?*
- *What, if anything, IT has to do with institutional quality*
- *Unique characteristics of IT support for the faculty*

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EDUTECH RESPONDS

Q. We identified information technology as a "strategic priority" at our university a number of years ago, and ever since, we have been pouring money into this area, including wiring the campus, networking the dorms, putting equipment on the desktops of all faculty members, and so on. Our problem is that we're having difficulty coming to grips with what our priorities for IT should be. Should we make all the classrooms electronic or should we have a formal training program for faculty? Should we get a new administrative information system or should we create more public labs? Needless to say, the demand for IT is insatiable, and we need some advice on how to decide who gets what and when.

A. *Your institution has done a wonderful and farsighted thing by recognizing the importance of information technology to the academic enterprise. Your difficulties, however, may come from the fact that it is IT itself that has been identified as a strategic priority on your campus, rather than the goals and objectives that IT is designed to serve—this is not much different from identifying blackboards as a strategic priority. IT is only a tool, and it should be in service to the institution's other educational, administrative, and community service priorities. IT is the "how," not the "what," and once your institution has determined its list of whats and put them in order of importance, IT can be applied to each of them accordingly.*

Q. Our president has indicated his willingness to be educated about information technology and its role in higher education. Can you recommend some sources that we can give him to begin?

A. *A "required reading" list might be this: Transforming Higher Education: A Vision for Learning in the 21st Century, by Michael G. Dolence and Donald M. Norris, published by the Society for College and University Planning, 1995; Organizing and Managing Information Resources on Campus, edited by Brian L. Hawkins, published by EDUCOM, 1989; Rethinking Teaching and Learning: A Reformation of Liberal Arts Education With Information Technology, by Grace Johnson-Page, published by Marietta College, 1997; and Using Information Technology to Enhance Academic Productivity, by William F. Massy and Robert Zemsky, published by Educom, 1995.*

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The Education Technology Newsletter for Faculty and Administrators

Troubled Times For Many IT Departments

"They come in when I'm not here and change things on my machine without telling me what or why." "They need some bedside manners—they treat us like we're stupid." "They need to be more tuned in to what the end users need." "In dealing with them, you have to find your own help lines of access." "Their newsletter is nothing but jargon." "Our problems with technology come from lack of leadership, not lack of resources." "They have not made enough of a commitment to the desktop for administrators; they are much too mainframe-oriented." "They have consistently had a well-deserved reputation for lack of a service orientation." "I have no idea how their priorities are set." "I call them for only the most generic problems; there is no specialized help available." "Faculty have no systematic input into their decisions." "Things happen only if you are friendly with someone in the department." "The department is simply a self-perpetuating bureaucracy." "They are very arrogant and independent; they often don't return phone calls." "It's not clear in their culture whether they consider themselves a support service or an end unto themselves." "Their attitude is 'We're not supporting X, we're supporting Y, so live with it.' "

These are troubled times for many campus information technology (IT) departments. Usually staffed by a dedicated group of smart, hard-working people, many computer centers today are nonetheless the target of user disappointment, administrative frustration, and faculty anger. The quotes above are real—they are from a large number of colleges and universities over just the last two years. They indicate a very disturbing trend, and one that needs to be reversed as quickly as possible: instead of users seeing the IT department as an ally for technology support and instead of the IT department seeing the users as partners

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"Technology adds the tools that facilitate access to the people, content, strategies, activities, guidance, and opportunities to apply new information that make learning a personal process. Technology adds the ability for students to choose how, when, and where they participate in the learning experience and to bring together a vast wealth of learning resources, including people, places, and things to which they might otherwise never have access."

Karen Smith
University of Central Florida
"Preparing Faculty for Instructional Technology"
CAUSE/EFFECT
Fall 1997

NEWSBRIEFS

INTERNET 2 UPDATE

Douglas Van Houweling has been named President of the University Corporation for Advanced Internet Development, to lead the Internet 2 initiative. Van Houweling, who served as dean of academic outreach and vice provost for information and technology at the University of Michigan-Ann Arbor, will coordinate the initiative with a budget of $2 million and five employees. The Internet 2 network will eventually run at speeds as fast as 2.4 gigabits per second. The organization is under a self-imposed deadline for bringing its network live by the end of 1997, with three university members, the University of Illinois National Center for Supercomputer Applications (NCSA), the San Diego Supercomputer Center, and the Pittsburgh Supercomputer Center, already connecting at 622 Mbps. Within the calendar year, it is expected that 40 or more universities will be linked at speeds of at least 155 Mbps.

The mission of Internet 2 is to "facilitate and coordinate the development, deployment, operation, and technology transfer of advanced, network-based applications and network services to further U.S. leadership in research and higher education and accelerate the availability of new services and applications on the Internet." For more information, see the Internet 2 homepage at http://www.internet2.edu/.

EDUCOM IMS PROJECT

With new methods just introduced, it will now be easier to search the Web for educational materials from many sources. The metadata specification recently announced by Educom is designed for materials used in higher education and provides a common vocabulary for searching and using the various components that make up individual lessons or whole courses of study. Publishers, educators, or anyone else putting learning material on the Web will be able to tag it with information such as the author's name, the learning objective, subject area, and licensing requirements. Educom is also making available a Java-based tool that will assist content developers in applying the metadata labels to their materials.

The metadata specification has been developed by the Instructional Management Systems (IMS) project, an academic, industry, and government partnership led by Educom. It is the first of a series of IMS specifications and software components that will enable Internet-based learning materials from diverse sources to be widely used. It is part of an extensive plan to improve education through open-access Internet technologies. The IMS partnership includes the California State University system, the Institute for Academic Technology at the University of North Carolina at Chapel Hill, the University of Michigan, the Committee on Institutional Cooperation (the "Big Ten"), Miami-Dade Community College, Apple Computer, IBM, Sun Microsystems, International Thomson Publishing, KPMG Peat Marwick LLP, the National Institute for Standards and Technology (NIST), and the Department of Defense.

For more information, see http://www.imsproject.org/.

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Troubled Times For Many IT Departments...

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in acquiring more technology resources, users and IT departments have become enemies and competitors for resources. As funding for technology continues to lag behind the demand for it, this situation will lead to increasingly drastic consequences: directors being fired, departments being outsourced, and draconian rules being imposed.

What to do? Is there any way to reverse this trend? Is there a way for troubled IT departments to get back to a mutually beneficial partnership with their users? The answer, happily, is "yes," but it will take some fairly major and profound shifts in thinking—largely, at first, on the part of the IT director, then eventually by the whole department. The following guidelines may help.

Stop blaming resources ——

Yes, there are too few resources to meet all the demands. Yes, the IT staff is overworked. Yes, you could make things a lot better if you only had a bigger budget. Well, you don't, so get over it and stop using this reason to explain and justify every gap in service. The fact is that resources are constrained *everywhere* in higher education these days. Besides, even if you had more staff and a bigger budget, you still couldn't keep up with the demand, because the demand is limitless and insatiable. The task, then, is not to match supply and demand, but to manage the gap between them.

Users are sympathetic to the resource argument, but only up to a point. Chances are that they, too, are understaffed and overworked and that their budgets are too small for what they're trying to accomplish. That's why they're turning to technology in the first place. So they quickly stop allowing that excuse to justify what they see as a poor level of service from the IT department.

Pretend you're Nordstrom's —

Nordstrom's has the same merchandise as many other department stores. They are in the same locations as many other stores. And they run out of things just as often as other stores do. But there is one thing that distinguishes Nordstrom's from every other store in the world—the attitude of the people who work there. Nordstrom's is famous for its world-class customer service. Every policy, every procedure, every staff training session is geared to a single concept: excellent customer service. Every person who works at Nordstrom's, regardless of his or her actual job, has the same basic task: make the customer want to come back. Make the customer feel so good, so welcome, so well treated that they *can't wait* to come back. In every transaction, show respect, show kindness, show understanding, and always exceed the customer's expectations.

> *Most users will not voice or write about their problems with the IT department—unless they are specifically asked to do so. An IT department that thinks it is doing okay because it doesn't hear a lot of complaints is just kidding itself.*

It's true that the Nordstrom stores are physically beautiful and that the concert grand piano makes for a lovely atmosphere, but that's not what keeps the customers loyal and constantly singing Nordstrom's praises. It is how the customers are treated every time they go there.

Compare that attitude of customer service to the typical troubled IT department. Although it is also in the business of providing service, it may not seem that way to the users. Can you imagine how long a Nordstrom's person would last if the customers thought he or she was arrogant? Yet "arrogant" is the most frequently heard description of the staff in a troubled IT department. Other descriptions include "uncommunicative," "rude," and "patronizing." It is almost incredible the number of times users will cite unreturned phone calls from the IT department as their number-one complaint.

Understand about complaints ——

One of the important things about customer or user feedback that countless studies have shown is that an organization will never hear directly most of the complaints about it. That is, when a customer has a problem, whether it be with merchandise or service or the fact that they don't like the color of the carpeting in your store, they will not tell you about it. They will just go somewhere else. If they don't have the option of going somewhere else, they will just seethe inwardly and become increasingly resentful and unhappy. It takes either a major crisis or an unusually aggressive person to complain. The only exception to this, and fortunately there is one, is when the customers are *specifically asked* how they feel (as in customer surveys, focus groups, market research studies, etc.).

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Latest Survey Results From

Electronic mail, the Internet, the World Wide Web, and multimedia are increasingly common components of the instructional experience for growing numbers of American college students, according to the 1997 Campus Computing Survey, a national study of the use of information technology in higher education. Additionally, growing numbers of campuses now have some sort of computer competency or computer instruction requirement for all of their undergraduates.

The 1997 survey reveals that almost one-third (32.8 percent) of all college courses make use of e-mail, up from 25.0 percent in 1996 and 8.0 percent in 1994. Fully one-fourth (24.8 percent) of all classes draw on resources available on the Internet, compared to 15.3 percent in 1996. And more than an eighth (13.4 percent) of all college courses use some form of multimedia resources, up from 8.4 percent in 1996 and 4.0 percent in 1994.

"The survey data document what is readily apparent on college campuses across the country," says Kenneth C. Green, visiting scholar at the Center for Educational Studies of the Claremont Graduate University and director of the project. "Information technology has become an increasingly important component of the instructional and learning experience, across all fields and all types of institutions."

The use of technology as an instructional resource is highest in universities. However, Green observes that the gains have occurred in all types of campuses: "Although students in research universities are more likely to encounter technology in their classes than their peers in four-year colleges and community colleges, the 1997 survey data document the expanding use of IT resources across all sectors of American higher education."

Despite the increased use of IT in instruction and the growing numbers of campuses imposing IT requirements on their students, the survey respondents continue to identify "assisting faculty integrate IT into instruction" and "providing adequate user support" as their top IT challenges.

This year two-fifths (40.3 percent) of the campuses participating in the annual Campus Computing Survey report having some type of computer instruction or IT competency requirement for all undergraduates, up from 33.1 percent in 1995 and 31.4 percent in 1992. Computer competency requirements are more common in four-year colleges (46.5 percent for public four-year institutions; 41.6 percent for private four-year colleges) than in public universities (33.3 percent), private universities (20.0 percent), and community colleges (39.2 percent).

Despite the increased use of IT in instruction and the growing numbers of campuses imposing IT requirements on their students, the survey respondents, typically the chief academic computing officer, continue to identify "assisting faculty integrate IT into instruction" and "providing adequate user support" as the top IT challenges confronting their institutions. Almost a third (29.6 percent, up from 27.3 percent in 1996) cite "instructional integration" as the top IT challenge, while another fourth (25.0 percent) identify "user support."

Technology costs are a growing concern for more institutions: fully a fifth of the survey respondents (20.4 percent, up from 17.4 percent last year) identify "financing the replacement of aging hardware and software" as the most pressing IT issue for their campus.

Faculty Recognition and Reward

While generally eager to see more and better use of technology in instruction, comparatively few colleges or universities provide recognition or reward for faculty efforts to do so. Well over half of all institutions have IT support centers and instructional development programs. However, just one-eighth (12.2 percent) formally recognize or reward "IT as part of routine faculty review and promotion" activities.

"Faculty recognition and reward are an essential if often ignored component of technology planning on campuses across the country," says Green. "The vast majority of institutions are sending a clear if somewhat punitive message to faculty: do more with technology, but learn the skills on your own time and do it in addition to your other

This article is based on a news release prepared by Kenneth Green, director of the Campus Computing Survey.

professorial responsibilities." The technology support centers and mini-grant programs operating at many institutions are useful, notes Green: "But faculty monitor the experiences of their colleagues. Failing to recognize and promote the instructors who invest significant time and effort to integrate technology into their teaching and syllabus sends a chilling message about the institutional commitment to IT integration in instruction and scholarship."

Internet 2

Although the Internet is clearly a critical resource for US colleges and universities, the higher education community seems split about the importance of the Internet 2 initiative. Over half of the university respondents (54.4 percent in public research universities; 70.0 percent in private research universities) "agree" or "strongly agree" that "access to Internet 2 by Fall 1999 is essential to our long-term technology needs." In contrast, only a third of the respondents in public four-year colleges (32.0 percent), private four-year colleges (28.8 percent) and community colleges (34.7 percent) view access to Internet 2 by Fall 1999 as essential for their institution's information technology plans.

Student Fees

The 1997 survey also reveals that growing numbers of institutions, particularly public colleges and universities, are charging mandatory user fees to help support the campus technology infrastructure and underwrite some of the operating costs associated with academic computing. The percentage of public universities with a mandatory IT fee rose to 56.9 percent on 1997, up from 47.5 percent in 1995. Similarly the percentage of public four-year colleges with mandatory IT fees also increased to 59.4 percent in 1997, compared to 44.0 percent in 1994. A third (34.4 percent) of the nation's community colleges also impose technology fees, up from 26.0 percent in 1994. In contrast, just 15.0 percent of private research universities and 31.7 percent of private four-year colleges currently collect IT fees from their students.

Even with the additional revenue generated by student fees, institutions struggle with financial planning for IT costs. The vast majority of colleges and universities continues to fund most of their equipment, network, and software expenses with one-time budget allocations or special appropriations.

Technology fees are highest for students in public universities ($140 annually) and public four-year colleges ($131). In contrast, the annual computing or IT fees average $102 for students in private universities and $112 for students in public four-year colleges. In community colleges the IT fee averages about $55 annually for a full-time student.

Financial and Strategic Planning

Even with the additional revenue generated by student fees, institutions continue to struggle with financial planning for IT costs. Less than a third (28.9 percent) of the campuses participating in the 1997 Campus Computing Survey report a working financial plan for IT, virtually unchanged from 1996 (28.1 percent), although up from 15.9 percent in 1990. The vast majority of US colleges and universities (70.1 percent) continue to fund most of their equipment, network, and software expenses with one-time budget allocations or special appropriations. Moreover, the majority of colleges and universities (51.6 percent) continue to operate without a strategic plan for information technology.

"Clearly colleges and universities are having a difficult time managing the financial dimensions of information technology," says Green. "The revenue from student charges provides some help. But student fees do not resolve the long-term financial planning issues that confront virtually all institutions, specifically developing and funding budget models that recognize the short 'working life' of critical IT resources."

Green adds that "campus officials must avoid the temptation to use the student fees to supplant, rather than supplement the institutional investment in IT." He notes that this is a particularly pressing issue for public institutions, as state officials may be tempted to reallocate technology dollars for other purposes, similar to the way campuses too often raid the library's book budget when money is tight. "Other infrastructure costs—computer networks, user support services, software and content licenses, computer labs and instructional classrooms—are key compo-

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Troubled Times For Many IT Departments...

continued from page 3

Similarly, most users will not voice or write about their problems with the IT department—unless they are specifically asked to do so. An IT department that thinks it is doing okay because it doesn't hear a lot of complaints is just kidding itself. Unfortunately, for the troubled IT department, it may have kidded itself for so long that the asking is being done by an outside consultant who has been called in by the administration to "find out what's wrong." A much better way is for the IT department to do the asking themselves. And it should be done on a regular basis, both formally and informally.

Asking the users of technology services how the IT department is doing can yield some very valuable information and it is an important way of preventing the department from becoming too isolated.

Pretend there is competition

Acting as if the users had a choice about where to get their IT services can be a very effective way of providing high-quality professional services. Asking the users whether they would return to the IT department for services if they had a choice is a very useful way of finding out how they really feel.

Of course, most IT departments do not have any competition. At least, it appears that way at first. But in a sense, they do. For one thing, the more troubled an IT department is, the more likely it is to see decentralized IT resources around campus: the person who "does reports" for the registrar's office, or the person who manages a microcomputer lab for the chemistry department. When users are questioned about the need for these decentralized services they will often cite the understaffing in the IT department, but then why not just add staff there? Because the real reason is that they don't trust the IT department. Doing it themselves gives the users the assurance that they will get the level and quality of service they require.

And then there is outsourcing—an option readily available to every institution. The problem is that the IT department often doesn't know that the institution is even considering outsourcing until it's too late to do anything about it. If nothing else, the very idea of outsourcing should create a productively competitive atmosphere.

Think like a partner

It's not "we-they," it's "us." It's necessary to think like a partner and to set up free-flowing two-way channels for collaboration, coordination, and participation. For example, rather than the IT department feeling like a helpless victim when the demands get to be overwhelming, it should participate with the users in setting realistic expectations by developing service level agreements, matching user expectations with the IT department's resources and capabilities.

Learning to listen is another important aspect of the partnership. Too often, the IT policy committee (if there even is one) is used as a vehicle for the IT department to review what it's done recently and to get a rubber-stamp for what's coming. Pretty useless in the long run (which is why a lot of participants stop going to them). Listening to—and really hearing—the community about things like how hard it is to access data in the administrative information system or how impossible it is to keep up with changes in their desktop software or how badly more training is needed can lead to some collaborative solutions and make the IT department seem like a much more responsive resource.

Do not set priorities

Setting priorities in the IT department is the classic case of a no-win situation; in fact, it is the very definition of it. Decisions about what task is more important than another and which user is more important than another should not be made by the person performing the work, nor by his or her manager, nor even by the director of the IT department. They should be made according to written, well communicated, community-based policies established by the top administration and faculty leaders, endorsed and administered by the users.

Now this is not something that the administration and the users typically do themselves with great joy. They often need to be encouraged to participate and shown how much better it will be for the institution for them to do this. And it does not need to be an overly burdensome process—it is a matter of establishing what the policies are, not the priority of each individual request. Once the policies are established, then priority setting is simply mechanical.

Yes, this means that the IT department is giving up some "power." But it is in return for the satisfaction of knowing that the department never has to say "no" to a request on its own. If someone gets a "no," it will be because of an institutional decision that objectively determined that this particular request is not as important as the ones currently being fulfilled.

Summary

The essence of all of this is the nature of the relationship. No matter how limited resources are, no matter what the nature of the technology is, the provision of excellent service in an IT department has much more to do with attitude than with product. ■

Latest Survey Results From The Campus Computing Project...

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nents of the campus technology infrastructure and need more than just student fees to be viable and reliable," says Green.

Software Standards

Most institutions operate as multi-vendor environments in the area of hardware and operating systems. However, many institutions have decided to support "only one" software product in key application categories. For example, more than half the institutions responding to the 1997 Campus Computing Survey report a campus standard for word processing (57.5 percent), application suites (60.0 percent), and Internet browsers (65.0 percent). Microsoft products dominate on campuses that have set standards for word processing (Microsoft Word; 47.3 percent) and software suites (Microsoft Office; 60.0 percent). However, the survey data also reveal that Netscape's Navigator is the preferred Web browser on US college campuses: although 35 percent of the institutions in the survey identify no preference on the Web browser issues, well over half (56.1 percent) have standardized on Navigator.

Smaller institutions appear more likely to establish standards than larger colleges or universities. For example, 80 percent of public universities and 57.9 percentage of private universities have not set standards for word processing products; in contrast, fully half of the public four-year colleges (50.5 percent) and private four-year institutions (51.9 percent) have standardized on Microsoft Word, as have almost half (47.9 percent) of the community colleges. Similarly, four-year institutions and community colleges are more likely to have standardized on Microsoft Office as the preferred "application suite," while the majority of universities have not set standards for this category of software.

"Campus standards represent, in part, the legacy of past practices as well as future assessments about dominant products and technologies," says Green. He adds that standards also reflect an effort to simplify user support efforts, as it simply costs less to support one product rather than two or three in a particular category, such as word processing, spreadsheets, or e-mail. But Green comments that the history of desktop computing is littered with shifts in standards and what seem to be dominant products and technologies. "Many faculty and administrators will recall that WordStar and later MultiMate were the 'standard' word processors of the 1980s. Yet today, these products are gone, nowhere to be seen. So too, today's 'standards' may eventually be replaced by newer, better technologies and products."

The annual Campus Computing Survey, now in its eighth year, is based on data provided by officials at 605 two- and four-year colleges and universities across the U.S. Participating campuses completed the survey during Summer 1997. Copies of the 1997 Campus Computing Report will be available on December 1st for $35 (postpaid). Contact The Campus Computing Project, c/o Kenneth C. Green, Box 261242, Encino CA 91426; (818) 990-2212; cgreen@earthlink.net. ■

In Future Issues

- *Ten questions the president should ask the director of information technology*
- *Is the merger of computing and the library a good idea?*
- *Unique characteristics of IT support for the faculty*

"Technology allows you to think of things you couldn't think of, it doesn't think of them itself. And it can be used for good or it can be used for evil. Technology is just our tool. We sanctify it—I mean there are conferences of propeller-head people who sit around for three or four days and talk about the technology rather than what the technology allows you to think of. It would be similar to 500 people getting together in 1902 to talk about typewriter keyboards and carbon paper. That would never have happened."

Richard Saul Wurman
"Technology and Learning: Celebrating the Connections"
Educom Review
November/December 1997

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EDUTECH RESPONDS

Q. Our campus network, while okay most of the time, was put together over the years in a somewhat haphazard fashion. That is, it was never really "designed" by anyone. As network traffic increases and the demands of the users for network services keep rising, we are re-thinking our approach. Any advice?

A. *Designing a campus network system these days demands special expertise and experience, (often beyond what is available on campus). Just as a college would look to an experienced architect to design a new campus building, it is appropriate to bring in an outside firm to design a networked environment. This architect should have proven success designing for campuses comparable to yours. And just as in designing a building, the architect should act as partner and collaborator with the faculty and students who will use the network and the technical services staff who will maintain and support it. A range of services should be provided, including assisting in developing requirements; helping to set priorities among the requirements and making adjustments required by the budget; developing capacity and load projections; specifying the staff and skills that will be required for network operation, maintenance, and troubleshooting; providing management, diagnostic, and measurement tools; designing the full configuration of the system; writing purchasing specs for equipment; assisting in developing a project schedule and implementation plan; supervising the implementation; and establishing procedures for final testing and acceptance.*

Q. Our students came back this fall to wired residence halls, and given the number of complaints, it looks like we should have prepared better.

A. *It's hard to predict in advance, but the support of student networking is very different from supporting the rest of the campus. The heaviest student use is at night and on weekends when regular staff are not on duty. As faculty give more assignments that require network access and as more students bring their own computers to campus, the interruption-free operation of the network becomes more critical. It will also be essential to provide access to the network and its resources for students who live off campus. Student networking is potentially of great value to the institution, but it is important to carry it out well.*

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EDUTECH REPORT

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Determining the Real Cost of an AIS

Virtually every college or university has an administrative information system (AIS) today, and while many institutions are more or less satisfied with theirs, a large number have undertaken a replacement project. If your institution is one of the ones considering, or in the process of, acquiring a new AIS, you have no doubt already figured out that you are looking at a substantial investment of resources. But accurately determining the total cost can be very tricky.

First of a two-part series

Unfortunately, there are plenty of examples of runaway software implementation projects, both in and out of higher education. How accurately can you predict the cost of the entire project for your campus? What should be included when reckoning up the price? What factors will affect the cost, and which of them can be controlled ahead of time? Where are the surprises likely to be? Where does "purchase price" leave off and "cost of ownership" begin? How can you come up with a reasonable budget for a project that typically extends over years and has so many parts?

There are three issues that need to be considered in trying to answer these questions: the things to include when estimating the price of your project, the factors that can influence the overall cost, and the realities of costing out a project like this.

Things to include in the cost

Buying an AIS these days is a little like sitting down in a restaurant in which there are no prices on the menu—you know right away that that's not because it's so cheap.

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"Many and long forgotten are the candlestick makers who did not learn how to make electric lamps. As the classic business-school case study has it, railroads made the mistake of thinking they were in the railroad business when they were really in the transportation business. So they were left far behind by trucks, buses, and airplanes. The moral is that we should not think of ourselves as being masters of a certain technology, but rather as fulfilling a particular human need, using whatever technology is available."

National Endowment
for the Humanities
NEH In the Digital Age
May 1997

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NEWSBRIEFS

A NEW WEB SITE FOR THE HUMANITIES

A new Web site developed by a public-private partnership among the National Endowment for the Humanities, MCI Communications Corporation, and the Council of the Great City Schools made its debut in late October. EDSITEment, designed to improve computer-based education in the humanities, "will list and provide links to the top sites in the subject areas of history and social studies, English and language arts, foreign languages and art history; it will provide on-line Learning Guides to the materials; it will suggest activities that reinforce learning through the Internet using the EDSITEment resources."

Humanities Web sites are selected from among hundreds of submissions by review panels of humanities specialists. Among the first twenty sites featured: the University of Pennsylvania's African Studies Web pages, Labyrinth (resources for medieval studies), the American Verse Project, Columbus and the Age of Discovery database, the National Archives and Records Administration's Digital Classroom, the Latin American Network Information Center, and the Victorian Women Writers Project. The site is located at http://edsitement.neh.fed.us/.

BU SUES INTERNET TERM PAPER SITE

Boston University has sued eight on-line sellers of term papers, charging them with violating a law banning the sale of such papers in Massachusetts as well as federal anti-fraud statutes. The lawsuit seeks an injunction to bar the companies from doing business in Massachusetts and seeks damages and legal costs, as well as the seizure of all term papers, theses, and research documents the companies have for sale. It was twenty-five years ago that BU successfully sued hard-copy-based term-paper "mills" in Massachusetts.

According to BU president Jon Westling, "It is an insidious game that results in harm to all students and to the public, which expects that a diploma represents genuine academic achievement. We will take whatever steps are necessary to preserve the integrity of the academic process." Even though all of the companies named in the suit, as well as many other similar companies doing business on the Internet, include disclaimers in their information about the mis-use of their materials, officials at BU are convinced that these companies encourage students to plagiarize.

CALL FOR PAPERS

The Teacher Education Special Interest Group of the International Society for Technology in Education is calling for submissions for their Annual Research Award. The Award is for those who are conducting outstanding research on the role of technology in teacher education, preservice and inservice. Recipients will be published in the *Journal of Computing in Teacher Education* and will receive a plaque and a cash award. Papers need to be submitted by December 1, 1997 to: Marianne Handler, Ed.D.; National College of Education; National-Louis University; 1000 Capitol Drive; Wheeling, Illinois 60090. For more information, contact Marianne Handler at mhan@nlu.nl.edu.

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Determining the Real Cost of an AIS...

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Software licenses. This is one of the most visible costs. Most vendors will provide a detailed price list in their proposal, either as a single price or separately for each module. Be sure to ask if any other modules or features are available but not included in the price list; you may find later that these are desirable add-ons. Besides negotiating the best price you can, you might want to put options in the contract for purchasing other features later on at the prices that are in effect when you make your initial purchase. You will never have as much leverage again as you do before you sign that initial contract.

You will also need to acquire licenses for the database system, query tools, and other essentials. If some or all of these are from third parties, your application vendor probably has a special pricing arrangement with those other software companies. If there are optional features, or if pricing is based on the number of users and you anticipate growth, you can discuss putting options for future purchase of these items into the contract as well.

Central server hardware. "The computer" used to be the major part of the cost of an AIS; that's no longer true. You can get advice from the vendor and from other customers about how big a central server you will need, but you are likely to outgrow it quickly. Consider budgeting for a series of upgrades to your hardware during the implementation period. The money you spend on the later models will buy more power.

Client hardware and software. Can the AIS project's tide lift all boats? Unless you are an unusual institution, there are probably not sufficient funds built into the technology budget to upgrade all the desktop computers on campus as regularly as they should be. Buying a modern AIS will make this even more apparent. Brace yourself for people asking for a new desktop computer in order to be able to run the new AIS. Debating whether the upgrade should be funded as part of the AIS project will not change the economic facts. You might as well survey your desktop needs and get the issue on the table before the project starts.

Besides negotiating the best price you can, you might want to put options in the contract for purchasing other features later on at the prices that are in effect when you make your initial purchase. You will never have as much leverage again as you do before you sign that initial contract.

Networking enhancements. Assess whether your campus is wired enough to handle the way people will use the new system. What will the growth curve look like? How will the mix of activities on the network change as the system matures? You may have some choice of architectures. For instance, some products allow different approaches as to how much of the programming logic needs to be downloaded to the user's computer.

Maintenance and support contracts. The software is nothing without the right amount of support behind it, whether it be for installation assistance, programming modifications and additions, help line calls, consulting, or project management. Training is another big piece of this. Maintenance and support is an item that will be fairly visible in the vendor's proposal, but be sure that they have budgeted enough for your site. Also, ask what increases there have been in recent years and look into negotiating the increase for a period of years after signing the contract.

The cost of maintaining overlapping systems. This is not parallel processing (a strategy most system installers avoid these days). Overlapping systems occurs during the period of time that the new system is being phased in, module by module, and the old system is being phased out, module by module. During this time, you need support for both systems, including applications software, hardware, probably different technologies such as the database management system, and so on.

Human resources. This includes technical and programming support, whether from existing staff or from outside sources, as well as extra personnel in the functional areas of the campus. Some of this additional cost will be just for the installation period (data entry for conversion, for example) and some may be permanent additions to the staff (such as a database administrator, a position that may not have been needed for the old system). Investing in existing human resources is necessary as well, including trips to conferences and to other campuses.

Note: *Part 2 of this article, discussing factors that can affect the overall project cost and the realities of costing out software projects, will appear next month.* ■

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Four Swing

by Steven

I suppose it isn't limited to higher education, but it seems especially characteristic here.... We recognize that the current situation has gotten out of balance. We readjust by over-compensating and moving things too far in the opposite direction. The cycle repeats. Endlessly. Here are four current examples.

Uniting or separating academic and administrative computing

A few years ago, many felt that at least on the administrative side of education they knew what they were doing with computing. After all, the functions weren't very different from those in most other industries. Payroll is payroll. Some real gains in cost-effectiveness were achieved by transferring practices from other industries to educational institutions.

Academic applications of technology have always been less obviously "productive," and they cannot be copied or adapted from other industries.

Many institutions began with administrative uses of computing and then tried to add some academic ones—hoping that the same group of people could support both kinds. As the academic applications became more important, this unified effort became problematic. There could never really be a balancing of priorities when one of the tasks was getting out the payroll punctually and accurately. For this and other reasons, administrative and academic computing were often separated. Given academia's anti-collaborative culture, it is hardly surprising that the academic and administrative computing groups didn't work together very often or very well.

Enter distributed computing, the Internet, "intranets," etc. and the desirability of having a standardized way of accessing tools and information. Student records have long been part of administrative computing, but recent technological developments on many campuses make that information more *potentially* accessible. Advising students about course selections and navigating academic programs has been an academic function—a responsibility of faculty and student services professionals. It now seems obvious that faculty and students would want to have easy access through "the network" to student information for such purposes. Now we have the basis for integrating academic and administrative computing and related activities. (We also have the basis for a new set of concerns about privacy, confidentiality, and data integrity.)

Uniting or separating the library and computing (and faculty development?)

As the Web and telecommunications become important academic tools, it seems that information management becomes a central task for those using information technology in education (and elsewhere!). Librarians have a long and rich tradition of developing skills, providing services, and helping others learn how to manage information resources. Shouldn't computing activities be brought under the library umbrella?

Meanwhile, libraries are becoming more dependent on telecommunications and computing for all their work, for managing all their resources, and for replacing (some) books with electronic services. Many librarians' training and experience was not focused on technology. Many librarians are not temperamentally suited to deal with the rapidly changing nature of computers and telecommunications services. Many librarians chose their careers because they value the orderly preservation of knowledge—not the excitement of the speed of calculations or of being the first person to try a new tool. Shouldn't libraries be brought under the computing umbrella?

There is a fascinating history of universities that have merged library and computing (and telecommunications?) services for a few years and then separated them again. Usually, too little attention was paid to the cultural and lifestyle differences between those who select careers as librarians and those who end up in careers as "technologists" (there really isn't even a title as comparably well-defined as "librarian"). Further, there is the major problem of finding an individual who is capable of being a credible and effective leader for both kinds of professionals. (See below.)

As the use of computing, video, and telecommunications become more important for teaching and learning throughout the curriculum, more faculty need help in re-thinking how to organize their courses, how they teach, and how they help students learn. Consequently, faculty development professionals (again, no widely accepted title like "librarian" exists) become more important. "Centers for Teaching Excellence" and "Centers for Teaching and Learning" are becoming somewhat more common. Some of these centers are usefully linking the resources and skills of libraries,

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Steve Gilbert is the Director of Technology Projects at the American Association for Higher Education. This article is based on his recent posting to the AAHESGIT listserv.

g Pendulums

ilbert, AAHE

librarians, computing centers, technology professionals, and faculty development professionals. I suppose these combinations also raise the possibility that the library and computing services should be put "under" a leader in faculty development; however, I have not heard of that happening yet. Perhaps this pendulum can't swing in a third direction!

Centralizing or decentralizing technology support services —— The model for providing technical support services often seems to reflect the dominant "architecture" for computing resources. Until the 1980s that model was a big machine to which people would travel to do their computing. Support services had to live in and near the central machine. Then we had "personal" computers; it appeared that support services could be anywhere, and that any department could hire and manage its own technical staff (this often didn't work out in practice). Now we have networked computers in which some functions run primarily on local machines while others run primarily on a "central" machine ("server") or elsewhere on the Internet.

The current trend—at institutions large enough and wealthy enough to support this pattern—is to have a mixture of centralized and decentralized services. Some technical support services are offered from a centralized organization (such as training on the basic uses of utility applications or establishing some institution-wide standards for operating system and software selection). Other support services are provided within departments or divisions (e.g., assigning a support person to the English department).

The competing forces are the desirability and cost-effectiveness of uniformity and standards vs. the need for combinations of software, hardware, and teaching approaches that may be idiosyncratic to a particular department or course. If the institution can afford and can find someone to lead and coordinate both centralized and decentralized services, such combinations may be optimal. But who are these leaders and coordinators, what are their characteristics, and where can they be found?

Creating or demoting a Chief Information Officer ("Computing Czar") ———— As I've described above, many college and university presidents find themselves faced with an array of puzzling decisions about information technology. It would be comforting to be able to create a new organizational structure that could handle those decisions, and to find a person who could shape and lead that structure. As the role of technology seems to become more central and significant to the institution—especially to the curriculum, it seems reasonable to create a position analogous to that of the Chief Academic Officer (CAO) or the Chief Financial Officer (CFO). So, many institutions have brought together some of the groups mentioned above (computing, telecommunications, library, media, ...) and appointed someone as the CIO—Chief Information Officer. The CIO is expected to oversee those functions and to participate as a peer with the CAO, CFO, and others as part of the leadership team for the institution.

Unfortunately, it is not yet clear which functions really belong under the CIO, nor is it clear what sort of experience and training such a person needs. There is no graduate program well-designed and widely respected to prepare such individuals. At first glance it seems that some combination of computer science, library science, and an MBA would be ideal—along with a lot of practical experience as an academic administrator. Doesn't this person also need some direct knowledge of the rapidly changing technology industry and new products and services emerging from it? And what about credibility with the faculty? Perhaps we should add teaching experience and an "earned doctorate" to the qualifications as well.

I don't know anyone with all these qualifications. Instead, mere mortals are hired to be CIOs and their lack of the full complement of skills and preparation described above may have painful consequences. I'm beginning to hear reports that at some institutions the CIO position was created and filled at the vice presidential level for a few years, then allowed to "sink" to become something like an associate vice president or associate provost for information technology or academic technology. The president discovered that the person acting as CIO couldn't keep up with the rapidly shifting responsibilities within the "information" and "technology" areas and at the same time contribute as a peer with the other vice presidents and provost in deliberations requiring an institution-wide perspective.

I imagine this problematic situation will improve as more administrators spend some time earlier in their careers gaining some experience within one or more of the information technology fields on a campus. Perhaps professional graduate level training will also be offered to prepare and certify CIOs. Finally, as institutions develop more stable overall structures for coping with the constant change associated with increasing reliance on academic uses of technology, the role of CIO will become more stable and feasible—or be eliminated. ■

MHEC Interactive Courseware Initiative

A committee of academic officers and courseware specialists from public and private colleges, universities, community colleges and technical colleges located in the nine member states of the Midwestern Higher Education Compact (MHEC) has been undertaking an examination of what comprises good interactive courseware. The hope is to create an initiative that encourages the use of such courseware in the classroom, helps institutions make good decisions in the acquisition of courseware, assists institutions in articulating their needs to courseware providers, and makes quality courseware cost-effective for such institutions.

The program is directed towards those academic disciplines and subjects that are characterized by widely diverse learner demands at various collegiate and career stages of learning where flexible opportunities to learn and enhanced instructional support are required to increase student success. The initial focus is on the general education components of undergraduate associate and baccalaureate degree programs; e.g. English, mathematics, natural sciences, social sciences, humanities, and fine arts.

Desired courseware features and capabilities

In keeping with the stated principles for program development, the committee is seeking top quality, commercially produced, interactive courseware that embodies the following features and capabilities.

Interactive Design. The courseware should provide well organized and dynamic interactivity (throughout the learning experience) between the student and the course content; between the student and the teacher; and among students sharing the learning experience. The human-computer interface should allow the instructor and the students to navigate the material easily and effectively.

Sound Pedagogical Strategy. It is highly desirable that commercially produced courseware be consistent with current knowledge on learning theories and precepts. It should be designed to provide strong support for instruction and the instructor and should facilitate instructor involvement in the learning process. It should utilize sophisticated multimedia tools to present curricular content. It should allow varying "time on task" in the learning process, and should allow variable levels of faculty mediation based upon the student's progress in the learning experience. The courseware should present alternate explanations of the curricular content to the student based on interactions with the student in the learning process, and it should provide a substantial electronic library of alternative follow-up assignments appropriate to results of student performance assessment throughout the learning experience. It is desirable that the courseware allow faculty members to use an authoring system to add material to the learning modules in order to individualize the course to their pedagogical approach.

Learner Centered and Faculty Friendly. The courseware should provide highly motivating learning environments, and accommodate different learning styles and techniques. It should be designed to be accessible on a time- and location-independent basis, and should include mechanisms to be integrative with preceding and succeeding courses in the broader academic program sequence. It should allow asynchronous, non-linear presentation branching in response to interaction with the learner, and should enable the student to move from topic to topic asynchronously; explore independently; and pursue multiple paths through the material.

The courseware should be easy to use with software technology that is transparent to the learner, and should accommodate student disabilities where possible. The emphasis should be on learning the course material; not the hardware/software system. Faculty and students should be able to access and move easily with little confusion or delay through and between technology-supported transactions such as instructional procedures, designs and functions; data displays and interactive communications; content presentation; query and analysis; instructional inputs; learner inputs; and report and feedback activation.

Flexible Applications. The courseware system should be modularly organized to accommodate different academic term lengths; e.g., quarter term, semester, trimester etc. in accordance with the institutions' academic schedules. It should allow variable enrollment limits, and accommodate differing faculty requirements regarding scope of content included in the course; presentation order of content; course management; course schedule and sequence; credit assignment; time commitment expected, including class hours and/or other course-related hours; course and section identifiers; course preparations; and sections to be taught.

Appropriate Content Guidelines. The courseware content should

This article was suggested by a listserv posting by Greg Earhart, Program Officer of MHEC, and is based largely on publicly available information.

meet the academic guidelines propagated by appropriate professional organizations as well as the curricular requirements of the institution. It should utilize acknowledged professional faculty expertise in its development. The content should be accurate and appropriate to the cognitive and affective specifications of the learning experience defined by the sponsoring academic department. Appropriate instructional design documentation, instructor's manuals and student reference guides should be included with the courseware as a part of the instructional support system.

Ongoing Evaluation and Assessment. The courseware should document the achievements by the students as they progress through the learning experience. Pretest/posttest assessment should be incorporated throughout the presentation of course content. It should include interactive testing within each learning module, and incorporate branching conditional on assessment feedback. It should also provide ongoing technology-mediated faculty evaluation and feedback to the student on his or her progress in the learning experience. Assessment procedures incorporated into the courseware should include appropriate readiness tests and/or remedial components in each learning module; a diagnostic component which will provide almost immediate detection and correction of incorrect answers or problem solving; outcome-based achievement measures embedded in the modules; the ability for instructors to choose and assign tasks; security procedures built into the assessment component; and access to support materials in the form of bibliographies and other resources in print and through the Internet.

Feedback/Report Generation. The courseware package should include, pre-installed, the most commonly needed evaluation and report templates, especially those which document the learner's mastery of content, current point of progress and readiness for subsequent content presentation. It should also provide for faculty-defined, customized report templates to accomplish faculty-defined instructional support functions.

Faculty Development Support. It is essential that the courseware provider offer an in-depth faculty development service component that provides faculty with the comprehensive technical skills and services needed to effectively utilize the courseware. Staff development materials should address initial use requirements as well as continued use enhancements. The faculty development process should be a continuous improvement process.

Note: *The Interactive Courseware Program is a region-wide initiative of the Midwestern Higher Education Commission developed and implemented by the MHEC Interactive Courseware Committee. For more information, see their Web site at http://www.umn.edu/mhec.* ■

"Thoreau's reaction to the telegraph—that now we would know quickly that Princess Adelaide had the whooping cough—has had its sad fulfillment in current media. That style will always outpace substance in the mass market is something we can happily endure. Seeing substance completely disconnected from intellectual life—as in the electronic banning of books currently under way in colleges and universities across the country and the world—is to endure the fearless promotion of a curiosity that will never be satisfied, and that will never eventuate in any sort of true advance in knowledge."

Phyllis Zagano
Boston University
Letter to the Editor
The Chronicle of Higher Education
October 17, 1997

In Future Issues

- *Ten questions the president should ask the director of information technology*
- *Is the merger of computing and the library a good idea?*
- *Unique characteristics of IT support for the faculty*

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EDUTECH RESPONDS

Q. We're trying to determine whether each of our students should be required to own a computer. We see such a requirement both as a way to cut costs and as a way to emphasize our institutional commitment to technology. One of the things we're wondering about is that this seems like such a good idea, but not very many schools have actually done it yet. Do you know why?

A. *Generally, requiring every student to own a computer goes hand-in-hand with curricular efforts to make the computer a valuable and indispensable tool of learning. Rather than cutting costs, colleges that require universal student ownership usually make a large investment in creating the environment of which the student's personal computer becomes a component. That environment includes networking, computer-ready classrooms and labs, information resources, support for student users, and support for faculty curricular development. Without it being a requirement, what we see happening now is that more and more students are bringing their own computers to campus. One thing you do need to be ready with is an answer to the question that comes in so often over the summer: what kind of computer should I (or my son or daughter) bring to campus in September?*

Q. We have a very large computer center and most of the folks are terrific. Unfortunately, we also have a couple of prima donnas that seem increasingly out-of-place in a professional services organization. Are we unique in this?

A. *Many college communities tolerate unusual behavior, and certainly the typical computer center has had, over the years, its share of individualists. Generally, in most places, these people have made major and important contributions to furthering technology within their institutions, especially during the early years of technology proliferation. But the relationship between technology and most colleges has evolved now from an individually driven environment to one of greater institutionalization. As the dependency on technology grows for more and more people, the need for reliability and predictability grows along with it, and this demands an environment that is driven less by individuals and individual initiative and more by institutional policies and processes.*

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Determining the Real Cost of an AIS

Are you starting to look seriously at replacing your administrative software and wondering how much money it will take? The first installment of this article catalogued the things to include when estimating the cost of purchasing a new administrative information system (AIS), including applications and database software licenses, central server hardware, desktop hardware and software, enhancements to the network, support and maintenance contracts, maintaining overlapping systems, and human resources. This concluding installment discusses factors that can drive up the overall cost of implementing the new software and offers some reflections on the realities of costing out major software projects.

Second of a two-part series

Factors that can affect the overall project cost

On a system-wide level, if you are considering buying major portions of your system from different companies and integrating them in-house (the "best-of-breed" approach), the total cost of the packages may be higher than with an integrated package from a single vendor.

But the project costs will go beyond just hardware and software. Although the sticker price of the hardware and software will command attention, it is only a part of the overall cost of a software implementation. Labor and services will make up a major portion of the true project cost. How much work will it be to bring up the new system, adapt it to your way of doing business, convert the

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"What has been billed as the information superhighway has, like all superhighways, come with a price. We have shortened the time between departure and arrival, but gone is all scenery in between, reduced to a Pentium blur. We settle for information at the expense of understanding and mistake retrieval for exploration. The vastness of the Internet's potential threatens to shrink into yet another utility. As the technology matures, the adolescent exuberance of surfing the Web yields to the drudgery of yet another commute."

Ted Gup
University of Maryland
"The End of Serendipity"
Chronicle of Higher Education
November 21, 1997

NEWSBRIEFS

CALL FOR PAPERS

Next fall, Rollins College will host a special conference for faculty and administrators interested in discussing current uses of technology in the classroom. "Teaching with Technology: Rethinking Traditions" will immediately follow the EDUCOM '98 conference in Orlando (just a few minutes from Winter Park). The three-day event will engage participants in small group presentations and discussions geared towards both the novice and the expert.

Abstracts are now being accepted for speaker, panel, and discussion sessions on innovative uses of computer software, multimedia, distance learning, and the Web in the classroom. Please include the preferred session format in an abstract no longer than two pages. *Information Today*, publisher of educational technology texts, has expressed strong interest in publishing the conference papers, pending abstract review. Abstracts should be postmarked by March 1, 1998 and sent to: Les Lloyd, Assistant Vice President for Information Technology, Rollins College, 1000 Holt Avenue, Winter Park, Florida 32789; llloyd@rollins.edu.

MASTERING THE NET

The Graduate Center of Marlboro College in Vermont will begin offering two new programs in January—a master of arts in "Teaching with Internet Technologies" and a master of science in "Internet Strategy Management." The mission of the Graduate Center "is to train individuals to lead the Internet and online strategies of corporate, non-profit and educational institutions." The programs will focus on teaching teachers how to incorporate the Internet into the classroom experience, and teaching managers how to oversee an organization's Internet strategy. The Graduate Center, designed for working adults, also provides customized technology training programs.

For more information, see http://www.gradcenter.marlboro.edu/home.html.

INFORMATION TECHNOLOGY AND TEACHER EDUCATION

SITE 98 is the ninth annual conference of the Society for Information Technology and Teacher Education (SITE), an international association of individual teacher educators and affiliated organizations of teacher educators in all disciplines who are interested in the creation and dissemination of knowledge about the use of information technology in teacher education. SITE 98 is hosted by the University of Virginia and will be held March 10–14, 1998 in Washington, DC. Presentations in the areas of diversity and international perspectives; multimedia/hypermedia; telecommunications; mathematics/science education; reading/language arts; early childhood/ elementary education; social studies; special education; and educational leadership are expected, as well as the chance to talk with companies and institutions offering educational technology products and services.

More information is available at the conference Web site at http://curry.edschool.virginia.edu/aace/conf/site/site98call.html.

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Managing With a Laugh

by J. Richard Harris, Ohio State University-Newark

Three hundred years ago (when I was in graduate school) we learned about Theory X, Theory Y, MBO, and about 27 other three-letter combinations which provided the easy key to management. Theory X touted the idea that all workers were mindless peons and nothing would work better than a decent whip and a big chair. Theory Y taught us that people wanted to do a good job and a simple chorus of "We Are the World" would be all that was needed to have a happy, healthy workplace. MBO? Well... I still don't understand MBO. Something about common goals and a shared vision, I think.

Management types then came up with Theory Z, Quality Circles, TQM, and the like. Many managers adopt these new "theories of the month" with the zeal of a brand-new Amway salesman and six months later are back out on the streets turning over rocks, hoping that a new management salvo will jump up and provide the magic cure. Well, to be honest, some of these management plans may have worked in the past, but let's face it: they aren't going to work today. Most management theories assume an abundance of low-level, but well trained, workers, who will buy into a plan of corporate *esprit de corps*.

We as IS managers in academia work in a totally different environment. I'll bet Peter Drucker never took a phone call from a faculty member about a book that was moved while your network guy was in his office. I'll further wager that Pete never had to deal with a committee whose members could only meet every fourth Thursday because everyone had different office hours! Traditional management theorists have never worked in an environment where it is necessary to try to keep top-flight technical talent, especially when you can pay only 75 percent of the going rate for that talent!

Are we in a "world of hurt"? Yes-sirree, bub! Managers are asked to do more with less, knowing full well that the few good people that they have could walk out the door and within a week get a new job and a 25-percent pay raise to boot! You as a manager are expected to walk the thin line between customer satisfaction and employee satisfaction. Which of these satisfactions is more important? The answer is somewhere between "The customer is always right" and "We are IS; if we ain't got it you don't need it."

> *I believe that your first duty as a manager is to your own people. If you can't keep your own staff happy, there is no way in the world that you can expect to keep your user community happy.*

I believe that your first duty as a manager is to your own people. If you can't keep your own staff happy, there is no way in the world that you can expect to keep your user community happy. By keeping your staff happy, I certainly don't mean that you should run a comedy club or provide catered lunches three times a week. I propose that you strive to maintain an environment where your staff knows that you feel that you are in their corner. Too many times, we as managers are too quick to take the side of the users.

If your department is turning into a "revolving door" or you are simply turning into a training ground for the local big industry, you are not doing your users a favor. I know that when I go to the local car dealer to get my car repaired, I *like* to see the same old faces working. It makes me feel that it is a good place to work, people are happy, and more than likely they will do a good job of fixing the car. If I see a lot of turnover, I assume that it is a bad place and something is wrong. I am not going to feel confident in leaving my car with them. I would hazard to guess that users tend to feel the same way about your computer staff. The total pre-occupation these days with "customer satisfaction" doesn't address the fact that your most important resource is your people.

Am I advocating a return to the "old" computer days of white lab coats? Not at all. While certainly life for the IT department was simpler back then (users had dumb terminals and only asked questions about software that you had *at least* heard of), users now have more of an idea about the capabilities of computers.

Traditionally, we have hired entry-level workers in our computer centers because we could not afford to

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Rick Harris is director of computing and telecommunications at Ohio State University-Newark. This article is based on his talk at the CAUSE97 conference in Orlando.

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Determining the Real Cost of an AIS...

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data, and get everybody trained? How much extra labor will it take, from added staff, from the vendor's support specialists, or from outside consultants? What follows are some of the factors that can greatly affect the final tab for personnel and services and some approaches an institution can take to keep those costs under control.

The condition of the data. The difficulty of getting to your destination depends in part on where you set out from. Converting data to the format required by the new system will be vastly easier if your current system is tightly integrated and your data is accurate and consistent. For example, it will make things a lot easier if your current student records, admissions, and financial aid systems all share the same basic information about students. Otherwise you will have to reconcile conflicting information as you prepare to move it into the new system.

If it turns out that cleaning up your data is going to be labor-intensive, you will probably spend some time deciding how far back in history you will go in converting your records to the new system. Some systems, for example, give you the option of loading summaries of each employee's payroll data as of a given date, rather than bringing over detailed histories.

Degree of customization expected. Another factor that will affect the cost of the project is the degree of customization that your campus ends up doing. It is best for the user community to discuss this issue ahead of time and arrive at clear expectations. Modifications are costly in terms of programming time and testing efforts. It is also important to remember that every modification to the baseline product is a mortgage on the future that comes due when the product is updated. So the policy on modifications will affect the cost of the project long after the initial implementation.

One reasonable approach is to avoid any but the most essential modifications ("plain vanilla") until a year or so after the entire implementation is complete. With this approach, however, everyone needs to be clear about the criteria that define "essential" and what mechanism will be used to decide each case. Also, there may be less costly ways to achieve the desired result. It is often cheaper in the long run to create a report that presents the data in the way it is needed rather than to attempt to modify the inner workings of the application.

> *In constructing your new freeway, you want to avoid simply paving the cowpaths, even if the cowpaths are named after very sacred cows.*

There is one silent assumption that you should be especially alert for. Make sure that nobody gets the mistaken impression that "the new system will be just as good as the old one [read: the screens will look exactly the same] or else we will spend whatever it takes to modify it until it does." Get everybody to agree that "new" really means new.

Another dogma that may emerge around the issue of modifications is, "Our institution is so unique that there are certain things we simply must change in the application to match our way of doing things." While there may be some truth to this, a software conversion is a good time to evaluate procedures that have gotten convoluted over time. In constructing your new freeway, you want to avoid simply paving the cowpaths, even if the cowpaths are named after very sacred cows.

Writing reports. As you tote up the list of jobs to be done during the implementation, the number of custom reports to be written will probably grow. This will occur as users begin to understand how generic the reports that come bundled with the application are. Although not as precarious as modifying the baseline software, report writing can grow costly through sheer volume. It is not uncommon for institutions to have thousands of existing reports, developed over years, that are used to run campus affairs. Again, there are good reasons for arriving at specific expectations about what will be converted and when.

Even if you could afford the labor required to convert all the existing reports by the first day of the new system's operation, that might not be the best course. You will probably be selecting the new system at least partly because it provides more powerful query and reporting capabilities and allows users to delve into the data more on their own. That advantage may make some periodic, printed reports superfluous. Another good reason for delaying the mass production of reports is to escape the cowpaths. When the users have gotten more experience with the new product, they will be better able to define how to make it serve their needs.

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Of course, a core of essential reports will be needed by the time serious testing of the system begins. It's a good idea to double your estimate of how long it will take to produce these reports, because of the learning curve required by the reporting tools and because of the trickiness that may be involved in reproducing the results created by the old system, with its different way of classifying things.

Relying on outside help. The cost of all these implementation activities may depend on who carries them out. Depending on your staffing situation as you enter the project, you will probably find that your existing staff has to be augmented in some way, perhaps to a significant degree. You will need extra staffing or outside services to handle training, project management, technical work, and adapting the software and the institution's business practices to each other.

You could end up with a combination of approaches to providing the needed extra hands: contracting services from the software vendor, hiring third party consultants, augmenting your staff with new positions (either to free existing staff from supporting legacy applications or to work on implementing the new system), or identifying people on campus who can free a significant amount of time from their current responsibilities to work on the implementation.

It is not just the computer services area that will need extra help. As each area's software comes on-line, the users' time will be stretched to the breaking point with setup tasks, training, and testing. If possible, it would be good to allow in your budget for some assistance for end-user offices, especially during their home stretch.

You will probably want to take advantage of your software vendor's expertise to train and help your users set up the application. Such services are often bundled with the software, although many institutions find themselves paying for more than the minimum package. You may even want to contract with the software supplier or an outside source for someone to manage the implementation.

When it comes to technical services, vendors and consultants can be good for targeted projects, but the hourly cost is high and adds up quickly. For time-consuming conversion tasks, some institutions find it more cost-effective to bring limited-term staff on board and train them in the skills they need, charging their salaries to the implementation project rather than regular personnel budgets.

Depending on your staffing situation as you enter the project, you will probably find that your existing staff has to be augmented in some way.

In calculating how much extra help you will need, remember that the demand curve will be cumulative. It will keep rising as the first modules come on-line and continue to require further support, while primary attention shifts to the next phase of the implementation. Because of cleanup tasks, the demand for extra support will fall only gradually after the last module of your software goes live, sometimes remaining high for a year or more.

The moving target. Before jumping on the train, gauge how fast it is moving. That is, what plans does your software vendor have for major updates over the years (yes, years!) during which you will be implementing their system? Many software developers are now scrambling to incorporate the newest technology approaches into their software, such as thin clients and Web access, and rewriting their software to modernize the user interface. You may find yourself doing what amounts to another conversion before the initial implementation is complete, complete with retraining users and technical staff. This kind of pace is desirable, even though it is somewhat painful, because you want your application developer to be committed to keeping the software up to date. But it is one more complication and cost to be folded into a realistic implementation budget.

Expanding beyond the AIS. Even if you are firmly committed to buying all the core applications from a single vendor (student records, financial aid, finance, human resources, and fund raising), you may find that certain specialty programs will be needed to round out your tool set. These may include programs for scheduling classrooms, calculating student need for financial aid, managing your meal service or bookstore, handling parking, tracking work orders, or calculating flexible benefits programs. The same reason that is motivating your campus to contemplate buying a new administrative system may also drive some key areas to consider automating or upgrading their operations and their very specialized

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Managing With a Laugh...

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pay the price for top-flight talent. It is certainly interesting that many institutions can bring in top-flight faculty members at a relatively high salary, yet balk when asked to ante up $30,000 for a computer support person.

It is incumbent upon us, and yes, it is one of our main responsibilities, to constantly petition upper management in our institutions to recognize the importance of IT. We need to increase our visibility within the organization. Too often, "computer types" are satisfied to sit behind closed doors and simply mumble and mash buttons. We need to become a visible and integral part of the planning process within our institutions.

How can you become a better manager? How can you keep the talented staff that you have? It certainly isn't easy, but here are a few thoughts to consider:

Never take yourself too seriously. For the most part, people are not going to live or die based upon our decisions. We are already viewed by the user community as being somewhat aloof and uncommunicative. Do your best to break down these barriers. Encourage an environment where you and your staff are known as more than "computer jockeys." And one of the best ways to break down a barrier? Humor!

It is OK to let your staff know that they are smarter than you. If you were as smart as they were, you would be doing their job! Me, I don't want to know the minute intricacies of Java, but I do appreciate those who do. Complement your staff frequently. If they don't do a good job, guess who suffers.

It is OK to get your hands dirty. Computer managers (especially in an academic environment) are not always hired because of their computer expertise. I will wager that many IT directors have never pulled wire or delivered a PC or even installed their own software. Given this assumption, many have no clue as to what is involved in the day-to-day activities of their departments. What do your people do all day while you are stuck in meetings? Why do you sometimes make promises and create deadlines that they can't meet? When users ask why it takes two weeks to have a computer delivered, do you immediately confront your PC technician and threaten to lay claims on his first born unless the complaint is resolved? When that critical wiring project isn't completed on time, do you rush to judgment on your own staff?

Ask your staff if they will show you how to pull wire, or deliver a computer or make "plug and play" really plug and play. Take a day and sit at the help desk and experience the frustrations of a front-line support person. You will gain the respect of your staff, and as a byproduct, you will gain the respect of your users.

First, assess blame. Many times the root of a particular problem is not with your staff. Yes, as a matter of fact, users *can* be unreasonable and need to be informed of such. The user community needs to learn to respect the computer center staff as professionals with an important role in the campus community.

Crosstrain. Users expect all computer people to know everything about computers. Maybe we should, I don't know. Nevertheless, we as managers need to devote the resources to crosstraining our staff. The fact that a key person on our staff is on vacation shouldn't mean that work will wait until he or she gets back. Cross-training helps to ensure that your department is productive at all times. It can also motivate your staff by giving them the chance to learn new things.

Listen to others, but always do what you think is right. Have you noticed that everyone on campus seems to know your job better than you? Give some people a computer and they become an instant technology expert! Look, you are the professional; you are the one that upper management relies on to keep them abreast of the changes in technology. Even if you have a technology committee, the final decision has to be yours. Managing a computer center by committee is a sure recipe for failure.

Don't micro-manage. This one is simple: hire good people and get out of their way. Your job is to keep the wheels on track and well greased. Provide general directions, provide ideas, handle political matters, and track progress. That's your job. Leave the technical stuff to your staff. Remember, they are smarter than you anyway.

Make people aware of the Domino Effect. Sometimes users, or even your own staff, make requests of you without looking at the entire picture. You are doing others a service by letting them know the impact of their requests. People tend to accept just about anything if they are kept in the information loop.

Reward your staff frequently. If your staff is doing a good job, tell them! It is very easy to get discouraged and overwhelmed in this profession. A simple thank-you goes a long way.

Life is good. Yep it is!! ■

Determining the Real Cost of an AIS...

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needs may not be met by the AIS. As you assemble your plan for implementing a new AIS, be sure to include representatives from all administrative areas, even if it is not immediately clear how their work will be involved with the core system.

The realities of costing out an AIS

Implementing a major software system that involves virtually every office on campus is more like a construction project than a capital purchase. You'll want to include a sizable contingency fund in your budget (ten or fifteen percent, if possible), just as you would for a building.

However, once you have worked out a detailed and realistic budget for your multi-year project, don't let that budget hobble your flexibility. Your institution should be ready to spend the contingency funds to meet unanticipated needs and take advantage of new developments. Have a mechanism in place for making strategic decisions along the way to put more resources into the project if they are justified for the right kind of reasons. The usefulness of the final product, not the exactness with which you followed the initial estimates, is what is ultimately important to the institution.

We have focused on cost in this article, but cost is not the most important thing about an AIS project. Don't forget the benefit side of the equation. From time to time, it is important to declare a dividend. That is, design the process so that some highly visible increases in service levels can be introduced even while the implementation is going on.

Perhaps the new system can help advisors do a better job, flash more up-to-date information about courses to students during registration, provide fuller benefits information to employees, or give managers more timely help in managing their budgets. Increasing the power of your institution to carry out its mission is the ultimate payoff, and that is what makes the cost worthwhile. ■

"Each year, members of the freshman class will know more than their predecessors about how to access information electronically, will have more experience about how to organize and evaluate what they have accessed, and will have greater expectations of the faculty's competence in a learning process changed by information technology. Today's child, who can set a VCR and play complex interactive video games, will not be willing to sit passively in college classroom 10 years hence to be lectured by a professor the way grandfather and grandmother were in 1960. Instead of viewing technology as a threat or a corrupting force, professors should regard it as offering extraordinary opportunities to make a difference in students' lives—and in their own."

Richard Kimball
The Teagle Foundation
Letter to the Editor
The Chronicle of Higher Education
November 14, 1997

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In Future Issues

- *The ins and outs of Service Level Agreements*
- *Ten questions the president should ask the director of information technology*
- *Leasing equipment: an effective financial strategy*

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EDUTECH RESPONDS

Q. We've been running our own computer store through the computer services department for several years, offering students and faculty discounts on computers that we want them to have. The problem is that this has gotten to be more of a burden than a benefit for us, especially with all of the other things we have to do. Is there a way to provide the same features without it being our responsibility?

A. *Computer stores were once a great way to both provide a great service for students and to offset some of the computer center's other costs with the revenue. But buyers have become more demanding, and increasingly expect a professional retail operation to be handling this important function. You can certainly outsource this service without concern that you might lose something in the bargain. The majority of colleges and universities today, if they offer this service at all, sell microcomputer equipment through either their bookstores or outside companies, many of which have special divisions for education and provide on-site support. The other aspect is microcomputer service, which is increasingly being outsourced, regardless of how the initial purchase in handled.*

Q. We are trying to get on a regular schedule for the replacement of desktop and public lab computers and peripherals. Two questions: what is the goal we should be aiming for, and should everyone be on the same schedule?

A. *With hardware capabilities and costs changing and improving as quickly as they are, a two-year replacement cycle would come closest to taking advantage of increasingly attractive price/performance ratios. However, three, four, or five years are more realistic options for a college or university dealing with a high volume of equipment. Staggering the replacement will help in terms of installation and service, so that, for instance, if you are on a four-year cycle, replacing a fourth of the equipment each year would be sensible. In terms of whether everyone should be on the same schedule, you want to be careful to not fall into the "Trap of Only" where someone decides that someone else "is 'only' doing word processing, so he or she doesn't need a new computer." Even day-to-day operational tasks such as word processing, Internet access, and so on, have become very hardware-intensive and need fully capable and up-to-date computers.*

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REPORT
The Education Technology Newsletter for Faculty and Administrators

Treat E-Mail As Part of Your Campus Information System

Your campus e-mail system may have grown dramatically in importance to your institution without anybody noticing. When e-mail was first introduced, it was an add-on, a convenience that supplemented the traditional forms of communication on campus (letters, memos, and telephone conversations). Today it has evolved to become not only one of the primary channels for communication, but also a depot containing much information that is vital to the operation of the institution. It may be time to assess whether the way your campus has implemented and protected e-mail is still suitable, given its importance. There have been cases where a campus lost e-mail services for days or even weeks at a time. The effect can be devastating, both on the IT department and on the institution. E-mail systems have become an integral part of the larger campus information environment and should enjoy the same operational safeguards and policy attention as the student records or finance system.

What effect could an extended loss of e-mail services have on your campus? Even more seriously, what would happen if the store of past e-mail files became unavailable? Assessing the importance of e-mail on your campus can be done by thinking about these questions.

What would happen on your campus if e-mail went out for one hour? One day? One week? One month? Would some times of year be more crucial than others? What if e-mail went out during preregistration advising or during the height of the hiring or promotion cycle or during the first week of classes? Which activities on campus would be interrupted? Are there courses that use e-mail

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"Now that we are starting to see, in libraries, full-text showing up online, I think we are very shortly going to cross a sort of a critical mass boundary where those publications that are not instantly available in full-text will become kind of second-rate in a sense, not because their quality is low, but just because people will prefer the accessibility of things they can get right away. They will become much less visible to the reader community."

Clifford Lynch
"Finding What's Out There"
Educom Review
November/December

NEWSBRIEFS

THE COST OF PROVIDING IT SERVICES

Dave Smallen, the director of information technology services at Hamilton College, and Karen Leach, the CIO at Colgate University, have been working on a national effort to collect data on the cost of providing information technology services in colleges and universities. Called the COSTS project, the effort has as its ultimate goals to provide useful data to project participants and to establish benchmarks for providing these services in an educational environment.

The first results of their effort, including the summary data and analyses for three services—network services, repair services, and administrative information systems—can be seen at http://www.hamilton.edu/personal/staff/dsmallen/cause97. More institutions are needed now to contribute data to the project. Smallen and Leach are urging institutions to participate, as this will provide value both for higher education as a whole and for the contributing institution.

This is an ongoing project and the goal is to compile data for many IT services by the end of 1998. These service areas include network services, desktop computer repair services, PC purchase/lease and installation, administrative information systems, help desk, curricular support, and training. If you are willing to participate, or if you have questions, contact Dave Smallen at dsmallen@hamilton.edu and/or Karen Leach at kleach@mail.colgate.edu.

THE CHANGING FACE OF IT

The New England Regional Computing Program (NERCOMP) is holding its annual conference this year on March 22–24 in Sturbridge, Massachusetts, centered on the theme of the changing face of information technology on campus. The emergence of new technologies and the rethinking of traditional campus roles and services are reshaping the face of IT organizations and professions. This conference brings together a North American audience to meet and discuss topics such as retaining and rewarding talented staff; the changing student; new media applications; electronic commerce; Internet2; managing the help desk; virtual professional development; reforming the computer science curriculum; and new organizational models.

NERCOMP is an affiliate of CAUSE, and CAUSE members enjoy a reduced registration fee for this conference. For more information or to register, see http://www.cause.org/nercomp/1998/nercomp98.html or contact nercomp@cause.org; (303) 449-4430.

SOFTWARE GRANTS

Under the A.D.A.M. Education Research Partnership Program, anatomical software packages valued at up to $20,000 will be awarded to higher education institutions for integration into their curriculum. To apply, one must create a hypotheses and one-year plan of action that describes the specific steps to be followed after receiving the grant. For more information, call 800-755-2326 or see http://www.adam.com.

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Treat E-Mail As Part of Your Campus Information System...

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heavily? Distance learning activities? Do instructors or advisers use e-mail to stay in touch with their students? Does the registrar's office e-mail schedules to students? Does the president use e-mail to maintain a web of contacts? Does the admissions office receive and respond to inquiries via e-mail? You might want to do an inventory of e-mail uses on your campus and examine how long each one could be interrupted without serious effects.

Reliability and recovery

Many of the approaches and measures used for protecting mainstream campus information systems apply directly to e-mail. The usual checklist can be used: physical security of the server, emergency power, protection from hacking and viruses, regular backup of data, availability of replacement hardware and software in case of disaster, a written and rehearsed recovery plan. But there are also some operational and even policy issues that make e-mail different.

Pick your e-mail system carefully. Begin by selecting the right software and protocols to implement e-mail. Many campuses started out with the e-mail system that was supported by the vendor of their all-powerful central computer. That was followed by waves of e-mail systems based on microcomputer post offices, LAN-based messaging systems, client-server mail delivery, and most recently, suites of groupware applications. Of course, there are some essential functional requirements for any e-mail system today: good desktop client software, support for attachments of various types, compatibility with Internet standards, ability to support remote or roving users. But the technology and architecture of the system you choose will also determine its robustness. Is it based on one central server or distributed servers and message stores? Does it implement a proprietary design that requires a gateway to other systems or does it use open standards? How complicated, fragile, and prone to disaster is the structure of the e-mail database? How well does the architecture scale as the volume of mail moved and stored increases rapidly?

Know your system's peculiarities and spend time on monitoring. E-mail systems are very active and dynamic. Just like large database systems, they typically need an administrator to keep an eye on them. E-mail stores can grow by leaps and bounds, especially if your users subscribe to listservs, or perhaps even act as hosts of listservs. Be sure you monitor file sizes, disk capacity, space allocations for directories. Implement a system of quotas for user storage and use operating system facilities or specialized software to monitor and enforce these limits. Carry out a regular procedure of compacting your message store, defragmenting the mail server's hard disk, or performing whatever other maintenance procedures are called for by the particular technology you are using. Regularly weed out obsolete and unused mail accounts.

Backup your mail system regularly. Are you backing up regularly? Offsite? Mail stores are complicated, especially ones that implement advanced features, so be sure to test the restore procedure to see that it works. Can you do a partial restore if necessary? Can you recover a single deleted message or restore just a single user's mail account?

Be ready for failure. Have a contingency plan. How quickly can you repair or replace your server hardware? Do you have a backup system that can be pressed into service if necessary? Note the effect of volume on disaster recovery issues. What happens after an interruption when your Internet service resumes delivery of the backlog of mail? This can turn a weekend problem into a disaster on Monday morning. Have plans for alternative connections to Internet mail.

Policy issues

Chances are, some policy issues about e-mail have already thrust themselves into the spotlight on your campus and have been addressed, such as how to deal with harassment, who has the right to an e-mail account, what is appropriate use of e-mail facilities. But there are other policy issues to consider as well.

Backups versus privacy. E-mail is not only a communication medium, it is also an environment for creating and then preserving important documents. The keepers of the e-mail system may find they have the custody of these documents briefly, for a considerable period of time, or even permanently. To add to the complexity of the issue, some of these documents are highly personal in nature, while others are official business, and all may be mixed together and not differentiated in any formal way.

The mandate for backing up the e-mail database is clear-cut. Like any information system, it must be backed up to protect against disasters. It is also prudent to maintain those backups for a substantial period of time because they may include documents that are vital to the institution's business. Furthermore, many users expect mail they have stored on the campus system to be safeguarded. Since the public

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Ten Questions

by Thomas Wa

On most campuses the FY 1999 budget requests have been turned in. Some deliberation and negotiation has taken place, and senior administrators have decided on a preliminary budget to bring to the trustees or university system authority. This is the season of wish lists and the ritual of renewing optimism. While many colleges and universities have multi-year plans for information technology, the annual budget process generally decides what remains plan and what becomes reality. But in fact, transitioning from plans to action happens throughout the year and in many different contexts. Asking pointed questions is an important way to focus attention on good criteria for decisions. We need rational ways to factor the still poorly understood complexities of governance in information technology.

These ten questions are offered to the provosts, deans, and vice presidents who quiz the campus CIO in the annual and perpetual search for IT wisdom.

1. ***What degrees of confidence can we assign to the premises in our plans?*** Or, for those who prefer concrete questions: How sure are we that the inter-building legs of the campus network need to step up to Fast Ethernet this year? How is the answer different if we look two years out, or three? Will gigabit Ethernet come on so fast as to make a decision for Fast Ethernet now somewhat risky?

In this example, we all start by agreeing that campus networks will saturate at some point. The productive discussion really turns on the pivot of "when." Going back to the abstract form of the question—when playing our role as advocates and persuaders, we tend to forget that even we don't believe everything with the same conviction. The issue is probably not "true" or "false," but rather, probability and how to use it reasonably.

2. ***Do we have an information architecture?*** Finished or not, the task of building infrastructure is no longer the frontier of thinking in information technology. Getting the money might still be a challenge, but knowing how we would like to complete the campus network and facilities is not. The more interesting and perilous planning issue now is how to move past the machines and wires to make sure we are looking at information: where it is, how to help it move, what we can do to bring it into play. "Architecture" means connections, structure, and integration.

> *Asking pointed questions is an important way to focus attention on good criteria for decisions. We need rational ways to factor the still poorly understood complexities of IT governance.*

Are we thinking, for example, how the on-line catalog of courses can include links to faculty web pages, syllabi, reading lists, library reserve holdings, and other information to improve the student's ability to make better registration decisions—and cut down on the "shopping period" that devalues the first two weeks of the semester?

3. ***What are we doing to recruit and retain good IT staff?*** The shortfall is reaching crisis proportions. Why has it taken us so long to realize that getting excellent staff is as important as getting excellent faculty and students? It is not possible to rely as much as we do on technology but then entrust it to under-qualified, under-trained staff who are spread too thinly. We do this because we cannot or will not pay higher salaries, but clearly we are going to have to do better than we have.

But what else are we doing to attract and keep the staff we would like to have? Are we defining jobs to include exposure what we know to be appealing in academic life—contact with lots of interesting people, the chance to work on a variety of projects, the opportunity to all be teachers in some way? Are we losing the good ones too soon? Do we have any mediocre performers who have been here too long? How can we take a more active approach to building staff quality?

4. ***Are we going to have a problem with the year 2000?*** No, the question has not been asked too often or answered definitively. Perhaps the software for core administrative practices (admissions, financials, fund raising) has been certified or at least under repair. But what about the HVAC controls that are still running on some "old" 386 with ROM that doesn't know about 2000? Attention in the trade press has moved beyond the panic over

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millions of lines of COBOL to check to discover that many systems—some of which are nearly invisible to us—might harbor unpleasant surprises.

This is also a good occasion to finally get serious about discovery, testing, and certification. In principle, we learned to do these things for disaster recovery planning (one of the official panics of the 1980s), but the year-2000 problem has a higher probability of happening than flood or fire. There will be nowhere to hide for those who think they are okay and then find otherwise. Easy assurances just do not suffice for this one.

5. ***What alliances with other organizations on campus (and off campus) are you developing?*** "Computer center" is now an oxymoron. To be effective, the information technology group needs to be variously interconnected with other groups on campus. These relationships have little to do with organizational charts and lines of reporting. Does Physical Plant still dig utility trenches without asking whether you would like to put in some extra conduit? Has your staff shown the a/v technicians how to troubleshoot video interfaces? Have you invited faculty to present specialized computing they know (e.g., GIS, statistics, interface theory and design)? Do you have contacts who can help us if we have to provide assistance to computer users with cognitive or physical disabilities?

It stands to reason that just as everyone now finds ways that information technology aids their work, many of those same people can contribute expert knowledge back to the campus community—if only we know they exist and see them as potential partners.

6. ***Are we ethical in our use of technology? Do we comply with the laws?*** Different questions, but both are part of the CIO's responsibility. It is all too easy to let concern for these issues slip in priority. The ubiquity of computers and the reach of networks make the risk of unethical or illegal conduct very real. When computers were tools for specialists we generally thought these problems were unlikely or at least possible to contain. Whether this belief was reasonable is now moot. With near-universal access, the probability of trouble approaches certainty.

> *"Computer center" is now an oxymoron. To be effective, the information technology group needs to be variously interconnected with other groups on campus.*

But misconceptions stand in the way of addressing these issues effectively. Users have a false sense of privacy and anonymity because most have no idea how accessible their network traffic can be. Some are naively trusting. Others are just as naive in thinking their improper activities are invisible. Managers have not all realized that because IT has entered the mainstream of life and work those responsible for it are also accountable for how it is used by people they don't generally see or know.

7. ***Can we be more creative about how we do things?*** The question comes easily enough when it really means, "can you do your job with fewer resources than you asked for?" But all excellent organizations are creative and encourage creativity across the board. Because IT organizations are often genuinely under-funded they tend to be self-conscious and even a bit strident about asserting their resource needs. When that bias becomes ingrained it can become a form of intellectual laziness. Finding different and better ways to do even mundane tasks is the key to keeping an organization vital and upbeat. Writing the end-user's name on the box as soon as new equipment arrives at the loading dock has many time and error-saving benefits. That is a clever method, and it doesn't owe its inspiration to resource shortages.

8. ***What are you doing to develop good public relations?*** This suggestion comes close to what computer shop insiders used to dismiss as "politics." But how many IT organizations have a poor campus image because they are invisible when they do their job well and only visible when something goes wrong?

The smart CIO realizes that PR is more than bragging. Publicly visible accountability may seem anathema to many in IT, but it is in fact basic to being viewed favorably on campus. Being accessible to end-users is important. Large organizations easily fall into the trap of shielding their most talented staff from the campus public—behind a phalanx of lesser-skilled workers—and so hiding their good work and abilities. In small organiza-

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Treat E-Mail As Part of Your Campus Information System...

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and the private, the ephemeral and the vital are commingled in these backup files, it becomes a problem to know just how to treat them.

For one thing, e-mail servers have the problem of storing data that is sometimes embarrassing to have around. And though we may think we have deleted it, or asked the recipient to delete it, a text may have gotten enmeshed in a backup system intended to preserve it for a considerable time. The fact that the following scenarios are even remotely possible may be enough to make some people nervous.

Scenario: Many years from now, someone gets his hands on backup media from your campus that contain mail messages from 1998 and manages to read it, even though the recording technology has fallen out of use. Most of it deserves to be long forgotten, but there is at least one student from those days who has turned out to be rich/famous/prominent and whose e-mail messages turn out to be most interesting indeed.

Scenario: In litigation over a tenure case, the plaintiff wins the right to examine e-mail archives for relevant correspondence. The thick envelope from the attorneys arrives on the desk of the director of technology.

Do you have a policy for ensuring the destruction of backups as well as their safeguarding? Can you be sure that a backup tape won't be discarded or reused in an insecure way, without being carefully erased or otherwise destroyed? Does your campus e-mail policy establish the proper length of time to preserve e-mail archives? This is the kind of decision that is best put in the hands of a body that makes high-level policy for the campus. As mail systems evolve into groupware, this issue will get more difficult. The message store may also contain project management time lines and task lists, contact databases, group or individual appointment calendars, and lengthy documents sent as attachments. Not retaining backups of this kind of information for a long time will become more risky.

Do e-mail systems using the POP protocol allowing users to download mail to their own computers reduce this problem? There is still the requirement that the system manager has to retain the backups for some period of time to protect mail that hasn't been picked up yet. But a further problem is that in the campus environment many of the users roam from one workstation to another, or between home and campus, and need to access their mail everywhere. Roving users tend to look to the central system to provide them the convenience of a mail file that follows them wherever they go. In the cases where it does make sense to remove mail consistently from the central server, such as in an administrative office, this may only move the problem one step. Now the PC's contents, including mail files, must be backed up, which is often done to a central server over the network, so the problem just resurfaces.

Encryption as an academic freedom? Since privacy and confidentiality are at odds with preservation and protection, some have suggested that the answer lies in encryption. There are two approaches. The central system can encrypt everything before it is stored, with the institution retaining the key. That at least removes the anxiety about unauthorized persons stumbling across a treasure trove of e-mail from yesteryear, but is cumbersome and does not grant any further privacy against access by the institution or outside authorities. The second model relies on personal preference and initiative, letting each person decide whether to encrypt personal e-mail using a software appliance. The key is retained by the user, providing more comfort than the first method. However, there are several problems with this approach. First, the trading of public keys is cumbersome now at best. Second, this relies on the user having a workstation and taking the trouble to encrypt the message. Finally, some institutions may actually be concerned about losing the right they now have to access private mail under some circumstances. The feasibility of both approaches may increase as better software and public key directories are developed.

Institutional access to e-mail. It should be a high priority to establish policies about appropriate use of e-mail by employees, by students, and by the institution, and to make the policies known to everybody. It is important to educate e-mail users about laws that may apply to their communications that they may not be aware of.

Avoiding an Irish Potato

What's an "Irish Potato"? It's something we take for granted that suddenly fails, leaving devastation in its wake. It's what happened in 1845 when the potato harvests failed throughout Ireland, victim of an unprecedented blight. It's time to look very carefully at the place of e-mail in the life of your campus, and see whether it could turn into an Irish Potato. Do you regularly take time out to ask yourself what the most important thing is that nobody is bugging you to do? This may be one of the answers: prepare e-mail for its enhanced role on your campus. ■

Ten Questions to Ask Your CIO...

continued from page 5

tions, staff who do not answer their own phones appear unnecessarily remote. A manager who calls to follow up will occasionally remind a person to say thanks for work done properly and on time.

9. ***If we used more quantitative measures of our performance would we get a different sense of how we are doing?*** What would be good metrics? This is not a suggestion for "management by the numbers." IT on campus has been able in the past to take advantage of its novelty and aura of wizardry to evade even simple measures of performance. How many help desk visitors rated their service as good or better? How does that number compare to last semester? Would it be a bad thing to set a goal to boost that number every semester? Do we use standard project-management techniques to balance cost, time, and specifications over the life of a project? Do we have any factual way of accounting for the time that staff spend on various tasks? How long should it take to install a new computer? Is it smart to spend all morning trying to fix a five-year-old printer?

10. ***If we could change anything we wanted in our IT picture on campus what would we do differently?*** Sometimes you just have to step that far back and ask the blue-sky questions. We face this question of the weight of legacy squarely when looking to replace administrative software, but why not extend it to all aspects of what we do? Many of us see staff turnover of 75 percent over five years; is it outlandish to ask how job descriptions or the persons filling them might be different? While the changeability of so much in IT is a source of discomfort, it should also allow adjustments and even wholesale re-makes that people in slower-moving fields would envy.

If these questions are well-conceived they should be equally welcomed by deans and the CIO. It may sound trite to suggest that good solutions follow from good questions, but it is very likely that the pressure and anxiety that have become seemingly permanent parts of the job in IT make it necessary to shake up our habits of thought. Feeling beleaguered does not encourage fresh and probing conversations about the business at hand. We also tend to talk too much with the already convinced. Planning was the vogue of the early 1990s; maybe asking each other intelligent, basic questions in the course of ordinary administration would prove useful now. ■

"As the rhythms and routines of peoples' lives change, it's natural that they will change the way they use time, respond to stimuli, develop and share ideas and preferences, and innovate new behaviors. When you use a wide-angle lens to examine the very general arena of learning (not education!), it instantly becomes apparent that this is true. The trend to watch is the way people are more actively choosing the learning they want..., which means—duh!—they tend to favor things that are intrinsically interesting.... This means that we need to make searching for information, finding patterns within it, and discerning the true value of various 'factoids' as fun and engaging as games are."

Larry Keely
"Designing for an Educational Revolution"
Educom Review
November/December

In Future Issues

- *Leasing equipment: an effective financial strategy*
- *Is the merger of computing and the library a good idea?*
- *A bit of nostalgia for "the good old days"*

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EDUTECH RESPONDS

Q. We've tried a number of times to use student help in our computer center, but we can't seem to get it right. The students clearly have other priorities, and we have trouble both making them stick to a schedule and holding on to them for more than one semester. I know a lot of colleges are looking at using students as a way out of the staffing shortages we're all having, but it doesn't really seem like a good alternative at this point, at least for us.

A. *Employing students in the computer center can be problematic, to be sure, but most colleges and universities are finding that the advantages outweigh the disadvantages by a considerable amount. There are some ways that can help make the relationship a mutually beneficial one. While students do have other priorities, they can be encouraged to feel that the work they do for you is important, engaging, and an investment in their future. You need to pay students decent wages (just as with your non-student staff members, there is a lot of competition for their employment), and the wages should be based on their experience and length of service with you (thus encouraging multiple-semester employment). It also makes sense to give them some formal training, close supervision (by a more senior student within a structure that gives the students a "career path" while working for you), and to be very clear about your expectations.*

Q. I'm the director of computer services and my boss, the vice president of finance, just informed me that the president and his cabinet is looking closely at an outsourcing proposal for my department. This proposal was unsolicited and I think it's very unfair that I'm not getting a chance to respond to it in a formal way.

A. *You should have a chance to comment on the proposal, but you need to be careful about being defensive. Keep in mind that it is very rare for an outsourcing offer to come in unsolicited; chances are that someone at your institution asked the outsourcing firm to at least take a look at your situation, and the most probable cause of this request is unhappiness or dissatisfaction with your services. This is a difficult situation, but you need to try to approach it in an open way, thinking about what's right for the institution. That's your best hope for making sure you become part of the solution.*

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The Education Technology Newsletter for Faculty and Administrators

In Search of Leadership; A Tale of Three Visions

Howard Strauss, Princeton University

Eons ago at Bell Labs, in my first real job, I had the privilege of working for Mike, the youngest person ever to make first-level supervisor. Mike was an outstanding manager. He was a technical star who was superbly organized and impeccably dressed. He nurtured his well-managed brood of software developers, cheering and cajoling us to greater technical heights as we advanced across the PERT charts adorning his office walls tracking our every move. Neither did he neglect our potential as future managers. One day, for example, he pulled me aside and advised me that buying my clothes from Barleys, a tony New York men's shop, would make me more desirable as management material.

Every non-manager I knew wanted to be like Mike and we all worked tirelessly to emulate him. His vision, which he pursued like a shark after a surfer, was to become the youngest CEO of AT&T. We wanted to rapidly ascend the management ladder too. The fact that we hadn't a clue as to why we would give up our engaging technical work to do this (except for the imagined high salary) did not dampen our admiration for Mike nor our determination to duplicate his success.

Ralph, another manager just down the hall, labored at his mission in a manner that sharply contrasted with Mike's cool, polished professionalism. It wasn't clear who, if anyone, actually reported to Ralph, but there was always a clamoring press-corps-like cluster of people following him wherever he went. There was also a constant stream of software developers rushing in and out of his office, oblivious to whether he was there or not, shouting excitedly

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"Effective, relevant education is already inextricably wed to technology. The printing press has been recast in silicon, and our texts are being translated into bits and bytes. These are some of the new pedagogical tools at our disposal, and we should be spending our energy as educators and educational technologists learning how to utilize them selectively and effectively rather than bemoaning their existence."

Lawrence Goldberg
Letter to the Editor
Chronicle of Higher Education
February 13, 1998

NEWSBRIEFS

THE FLASHLIGHT PROJECT

The Flashlight Project, created by the Annenberg/CPB Project and sponsored by the American Association for Higher Education, helps educators study and evaluate educational uses of technologies by providing a suite of evaluative tools, training, consulting, and other services. Flashlight has a variety of applications, including guiding improvement of courses and courses of study (e.g., majors, minors, freshman year skills development, writing across the curriculum) and strengthening the roles played by technology in such efforts; evaluating major grant-funded projects; improving technology-based services (e.g., libraries, computing services, telecommunications and Internet connectivity) and their leverage in educational improvement; supporting integration of strategic thinking about the curriculum and technology services; preparing for accreditation; helping faculty, departments, or institutions compare their uses of technology and outcomes; and redesigning student evaluations of faculty.

For more information, see http://www.aahe.org/technology/elephant.htm. To subscribe to a free electronic newsletter that publishes information about workshops and availability of tools, send e-mail to listproc@listproc.wsu.edu with the one line message: subscribe f-light (your name).

THE WELLSPRING

Instructional Systems Inc. has announced the launching of a new Website dedicated to the needs of those involved in creating, teaching, and administering Web-based college-level distance learning courses. The goal of "The Wellspring: An On-line Community of Distance Educators" is to provide faculty, distance learning coordinators, and other interested parties with a central meeting place to discuss matters of common concern, link out to the best journal articles and other documents on-line regarding Web-based instruction, participate in a series of regular on-line "Special Events," and in general share experiences in delivering on-line education. The Website contains discussion forums, reading rooms, and seminar rooms. Special Events include live chat sessions.

Much of the thinking behind The Wellspring and its construction is due to the work of faculty and students from Teachers College of Columbia University. For more information, see http://wellspring.isinj.com.

CAUSE PARTNERSHIP PROGRAM

The Partnership Program, one of the offerings of the CAUSE Institute, focuses on the organizational challenges posed by the emergence of technologies on campus that make possible a broad distribution of information resources responsibilities. This program addresses issues related to the changing distribution of power, authority, responsibility, and customer support and participants in the program are encouraged to attend with one or more of their campus partners.

The next program will be held on July 19–23 in Boulder, Colorado. For more information, see http://www.cause.org.

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In Search of Leadership; A Tale of Three Visions...

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about arcane technical details and covering his desk, chairs, and walls with notes, each one of which vied to claim Ralph's attention first.

Even before I had met him, it was clear that Ralph was doing the most important work in all of Bell Labs, and perhaps in the entire civilized world. Once I talked to him I knew my assessment had far understated his passion for what he was doing, though he was just developing some neat new software. Many of the people that seemed to work for him actually had other full-time jobs at the Labs; soon I too found myself spending lunch hours, evenings, and every spare second working for Ralph.

Ralph gave me all the work I could handle and then some. Vast expanses of the project that seemed far beyond my limited experience were dropped in my lap. Ralph's passion quickly became mine. However important he thought his software was, it was soon even more important to me. If Ralph had dreams of climbing the corporate ladder we never knew it. All we saw was his vision of creating new cutting edge software which Ralph pursued with a religious-like fervor. All of us who labored with him would have followed him to the ends of the Earth.

Midwood High School

In the Flatbush section of Brooklyn, New York, the Midwood High School's 4,000 students are crammed into a decrepit building designed for 2,200. The three science labs they have lack electric outlets and exhaust systems, and the maximum capacity of the library is 63. Half the students choose Midwood as a magnet school and the other half, who are homogeneously mixed in, are randomly selected from the racial and ethnic olio of the surrounding bleak neighborhood. The school is 43% black, 29% white, 18% Asian, and 10% Hispanic. Teachers struggle with overcrowded classes, ancient equipment, and the lack of money that plagues most inner city schools. You might expect that there would be a high drop-out rate, high crime rate, chaos, and lack of learning as a result of these sad conditions, but you'd be very wrong. Ninety-nine percent of the students graduate and go on to college. Last year 50 seniors went to Ivy League colleges and the graduating class was offered over $28 million in scholarships. This year thirteen of Midwood's students, the highest number from any single high school in the nation, were semi-finalists in the prestigious Westinghouse science talent search. Five previous winners of the talent search have gone on to win Nobel prizes.

Midwood High's kids are not smarter than the kids at other New York high schools. Their teachers are not handpicked. They are very lucky, however. They have a principal, Lewis Frohlich, with a vision and a passion for making his vision a reality. He is a great leader, and like all great leaders, he manages to get his passion shared by many other people. In this case, it is shared by many of Midwood's teachers, their students, and the parents of their students. Mr. Frohlich's vision is to have his students excel and become passionate about learning. He wants to have them all go on to the best colleges and to win the prestigious science prizes that are the traditional domain of prep schools. The crowded classrooms, heterogeneous students, lack of facilities, low budget, and a thousand other things that lesser leaders than Mr. Frohlich use to explain their own failures only makes Mr. Frohlich's job more difficult. None of this stops him or gives him pause to question his vision.

Lockheed Aircraft

Since World War II, virtually all of the fastest, highest-flying, and most innovative military aircraft were created in the same place. A short list of the cutting-edge aircraft developed there includes the P80, America's first jet fighter; the F-104, our first supersonic attack plane; the U-2, our high-flying spy plane; the SR-71 Blackbird, the world's fastest airplane; the F117 stealth fighter; and many others. These creations were so advanced, that for decades after they were built, no aircraft could challenge their records. The SR-71, for example, designed 40 years ago in 1957 and now retired, would still be the fastest, most high flying air breathing plane were it to sneak out of the museums that now hold it.

Were these planes built by Boeing, the world's largest maker of commercial aircraft? Were they built by the innovative people that built the SST, the MIR, or the space shuttle? No, they were all creations of Lockheed's Skunk Works, a small group of dedicated scientists and engineers tucked away in a few windowless hangars in Burbank, California. There they were insulated from the kind of corporate management that controlled the fortunes of the rest of the Lockheed Corporation and the other major aircraft companies and that would have made it impossible for the Skunk Works to work its extraordinary magic.

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Howard Strauss is Manager of Advanced Applications at Princeton University and is a frequent contributor to this publication.

The Benefits of Leasi

by William Do

Wabash got into the leasing business in 1988 when we needed to replace a computer system and a thick-net wire network but did not have the cash available to make those purchases. At the time, none of us really understood the leasing business. We knew only that we needed cash to purchase equipment and we didn't have the cash. One of our vendors, Indiana Bell (now Ameritech), said that they could help and suggested that we lease everything from them. So we leased a MicroVAX 3400, a fiber backbone, hubs, Netware, Netware servers... In fact, we leased everything that we needed to meet our technological goals for that year. Even the installation charges were wrapped into the lease.

Types of leases

We soon learned a great deal about leasing. We learned about fair-market or true leases and capital or $1-buyout leases. In a fair-market lease, the leasing company owns the title and thus the equipment. In this case although the College is exempt from property taxes, the leasing company is not and so the leaser (the College) is liable for property taxes on that equipment. (If the leasing company has the proper agreements with the state, neither the leaser nor the leasing company is subject to sales taxes.) The cost of a fair-market lease, however, can be considerably less than the cost for a capital lease.

The leasing company, in effect, is charging interest only on the value of the equipment that you use while you hold the equipment. After the end of the lease, either the leasing company and leaser negotiate a fair-market value for the equipment or the leaser returns all of the equipment to the leasing company.

In a capital lease, the leasing company is loaning money to the leaser with the equipment serving as collateral for the loan. Since the leaser holds the title to the equipment, the college doesn't have to pay property taxes. It is like a time-payment plan and in the end you own the equipment. We have done both kinds of leasing.

> *We felt we had to move the cost of computing from the capital projects budget to the operating budget so that computing, like the library, would simply become a "cost of providing a learning environment."*

Replacement cycles

Having made the step into leasing in 1988, we started wrestling with the problem of the three- to five-year replacement cycle. While every proposal for a new VAX seemed to have the language, "this will last into the next millennium," inevitably, we replaced the system within five years. And, of course, as we started the move to distributed-computing on the desktop, we recognized that instead of having one or two machines to replace we would be having many machines to replace. The Treasurer of the College felt we had to move the cost of computing from the capital projects budget to the operating budget so that computing, like the library, would simply become a "cost of providing a learning environment."

There are several ways you can do this. You can increase your operating budget providing replacement dollars as a regular part of the budget, you can "lease from your endowment," or you can borrow money. Our Treasurer chose this last option, which I will explain below.

Why do we lease?

Simply put, leasing moves the dollars from the capital budget to the operating budget. For example, my leasing budget started at about $100,000 a year. That was for the first lease which was five years. Since 1988 that line item has grown to about $400,000 and covers about 80% of the computer hardware on campus that costs more than $1,000, including all Alphas, servers, routers, hubs, laser printers, and most Macintosh computers and Intel-based PCs.

We have a replacement schedule of three years for classroom equipment and five years for faculty offices. So, in 1991 we leased 24 PCs for a new classroom. Those were Dale 286 computers. In 1994, those computers were replaced with Gateway 486 DX computers. In 1996, those were replaced with Gateway Pentium computers. But, you say, the computers were in the lab for only two years, not four. In 1996, we moved the 486 DX machines to faculty offices replacing the last of the 386 machines. All of those moves happened without any budgetary approval other than the approval of the budget for Computer Services. The result of this policy is that 90% of faculty and

William Doemel is the Director of Computer Services at Wabash College.

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as a Financial Strategy

, Wabash College

staff have machines that are less than five years old and all student machines are less than three years old. At the same time, very few faculty and staff have new machines but every one of them has a machine that meets their needs. For example, the chemists have had new machines about every two years because their needs have grown faster than the cycle. Their machines have moved to other faculty or staff whose needs have increased at a slower rate.

We have had excellent relationships with our leasing vendors. We buy the equipment, usually from the manufacturer, and then "sell" the equipment to the leasing company who then leases the equipment to us. We are responsible for maintaining the systems but we have been purchasing three-year repair contracts with all of our machines except Macintosh computers. Usually, we end up swapping parts for the vendor on the equipment. Since we maintain the equipment, that means that some systems are very different at the end of the leasing period. The machine may have a new monitor, a new hard drive, and more memory. So we must maintain records on every system so we can tell what we have added and/or replaced.

Does it save money? You have to remember that our goal was to move the costs of computing from the capital side of the budget to the operating side of the budget. We also wanted to maintain equipment on the campus so that it meets the learning needs of the College. We did not set saving money as a goal. The interest that we pay on the money that we use to lease computers has ranged from 8 to 12%. At the same time, our endowment has been earning between 14 and 17%. So the answer is that while saving money is not a goal, we have been able to offset the cost of the money.

What have we learned? You will note that under our current arrangement, we buy the equipment and then sell the equipment to the leasing vendor and then lease the equipment. Initially, the leasing vendor purchased the equipment. That proved to be a nightmare for both of us. The equipment never arrived as described and getting everything straightened out took months. So we set as a requirement that we purchase and then resell the equipment. This has not been a problem for the computer vendors since we are leasing the equipment that we are reselling to the leasing company. In the case of capital leases, since we hold the title all along, this has not been a problem. All of our leases for Apple equipment have been capital leases so that the leasing company never holds title.

One of the important things we learned is that it is important that faculty and staff understand that they will have computers based on their need rather than on their standing in the College.

We started out with five-year leases, now all of our computer leases are three-year leases. Only servers have much residual value after only three years. Interestingly, the NSF would not allow us to lease computers; we had to purchase them. But we got an agreement from NSF that after three years, we could replace those computers with leased computers. Those computers were all in a classroom.

Another thing we learned is that it is important that faculty and staff understand that they will have computers based on their need rather than on their standing in the College. Furthermore, for this to work, every department, the rich and the poor, need to be treated equally.

At Wabash, departments do not "own" or "control" computers, even computers from grants. The computers are owned by Wabash College and are controlled by Computer Services. Faculty and staff have accepted the system universally because they always have the system they need to do their work on their desktop. Moreover, the faculty and staff are the ones who make the decisions about the initial purchase. All requests for new equipment must flow through a Computer Advisory Committee consisting of three faculty, three staff, the librarian and the Director of Computer Services. The managers of various technology areas, the media services, and reference librarians sit *ex officio* on the Committee. This groups prioritizes requests; the Budget Committee then decides where to draw the line.

This may not be a strategy that works for every school, but it has served us well. Leasing may be unconventional, but it is certainly worth considering as an option. ■

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In Search of Leadership: A Tale of Three Visions...

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Sputnik with cup holders? Perhaps you counted four visions above, not the three that were promised. But Mike's vision is no vision at all. He is the perfect manager, one who would be equally adept at managing a factory or a hospital. Give him some goals and stand back. If you offer to promote him he'll exceed your expectations. He is like a genie whose only vision is to grant your vision. He has no visions of his own.

It is no secret that good management is required to get nearly anything done well. The fine work by people like Mike at Bell Labs resulted in the creation of the ESS computers; these machines and their offspring do the bulk of today's telephone switching and have been very profitable for AT&T and its stockholders. But then we have the transistor, the C programming language, and the Unix operating system, all of which revolutionized the way computing was done. These, created by people more like Ralph than Mike, did not initially make AT&T much money—they just changed the world.

Good managers like Mike are vital to a university; they make for efficient, well-run, good universities. But they don't make for great ones. They don't produce Westinghouse talent search winners from a brew of bad neighborhoods, overcrowded classrooms, and chronic shortages of money. That takes something even rarer than good management. It takes great leadership. Ralph may have been a mediocre manager, but he was a great leader.

Great leaders have great visions. President Kennedy, had he been a fine manager, might have said, "We'll put up an even better Sputnik than the Russians. It will be longer, wider, and we'll have one named for each state in the Union." Instead, his vision was that we'd land Americans on the Moon—and soon. And of course we did. You might not agree with his vision, and many didn't, but it was nonetheless a grand vision.

A leading story Dennis Snow of Disney University talked to the attendees at the CAUSE conference this past December about leadership, and he put it in terms of "story." A great leader's vision is a story that demands to be told. A leader is the creator, disseminator, keeper, and enforcer of the story. Everything that is done anywhere in the domain of the leader must be "on story"; that is, everything anyone does must move the vision of the leader forward. A great leader must get everyone to tell the same story and to be scrupulous in maintaining the integrity of the story. Being off-story is never allowed.

Great leadership allows all the "laws" of conventional wisdom to be broken and can get ordinary people to do extraordinary things. Conventional wisdom says that smaller classrooms lower the dropout rate. Midwood High's dropout rate is 1% yet the classrooms are jammed. Conventional wisdom says that you need to pay teachers more money to attract the best teachers and get the best results. Midwood's teachers are paid the same as all other New York public school teachers who chronically complain that they are lower paid than teachers in the suburbs. With 99% of Midwood's seniors going off to college and sharing $28 million in scholarships, you have to wonder what the suburban schools are doing with all their extra money.

Much ado about fussing In addition to grand visions and great passions to see them happen, great leaders make a big fuss about the details of their vision. When you are doing something important, and all great leaders know they are doing important things, every detail speaks. Even details that you might think no one could possibly know. It's important enough that you know. By getting people to fuss with every detail, a good leader reinforces the commitment to his or her vision and makes a great vision greater.

If you visit a Disney theme park you are bound to bump into some people dressed as Disney characters. Of course they'll be on story. You won't, for example, ever see Snow White smoking, and every Donald Duck will look exactly like every other one. After all, to children there is only one. Children often ask these characters to autograph some souvenir, and of course, they cheerfully do so. Pull out those trinkets autographed by Goofy and compare the signature to anything else ever signed by any other Goofy. You'll notice the signatures are always the same. Disney understands the power of fussing with details.

Is it really important that all Goofys have identical signatures? In isolation, probably not. But when a thousand little things such as these are tweaked to make them better, the effect is astounding. For example, Disney asks each of its employees to spend just five minutes a day giving a guest or other employee a "magical moment." Five minutes doesn't seem like much, but that's about 250 magical moments per employee per year. A thousand employees would deliver a quarter-million magical moments per year. How many magical moments is your organization delivering each day? What would happen if everyone delivered one each day?

A brief history of the management of time

You've probably read a book on time management or gone off to some time management course. The rules are pretty much the same: block out specific times for every task and be sure that every block is filled with just enough to do. Put the important stuff in blocks first, then fill in with less important stuff. Doing this right will keep you busy every moment of the day—but you may be very busy without accomplishing anything useful.

Time cannot be managed. Each of us gets precisely an hour of time each hour, and during that hour you will do exactly an hour's worth of stuff. But your objective isn't to keep busy, it is to move toward some goal. Without strong leadership you will not have sharply focused goals. A major problem of having no well-defined goals is that if you don't know where you are going then everything you do will be equally good at getting you there. You don't need time management, you need goal management. And that requires great leadership.

Instead of carving up your day into little pieces in which you award yourself points for staying busy, you need to work on refining your visions and be sure you are moving as fast as you can towards fulfilling them. In fulfilling your vision there is nothing unimportant if it moves you in the right direction.

Managing an organization or a task is often done much the same way as managing time, with similar results. If things are not really well managed then everyone might be kept very busy all the time while having a total lack of productivity. A busy, well-organized organization does not have to be actually accomplishing anything.

A silk purse from a sow's ear

Good management is essential for your institution to run well, but though it is rare and having it is a delight, it is not nearly enough. You don't want to spend your life laboring at a good place to be when there are great places you could be. Your students and potential students might also realize this some day. A lack of great leadership may be the only thing keeping the place you are now from being the place you'd really like to be.

Doing extraordinary things with ordinary people does not require that you be a prestigious research university or have a zillion dollar endowment. If Midwood High can achieve extraordinary results, you can too. And like all of the successes of great leadership mentioned here, not only are the outcomes great, but everyone involved finds the experience exhilarating. Midwood's students and faculty put in extraordinary effort and hours and have a great time doing it.

The folks at the top of your institution are key to great leadership. But if you can't budge those folks, become a leader yourself. Create your own vision and find the passion to make it come alive. This won't be as good as having leadership come from the top, but leadership anywhere is better then none at all. With great leadership everyone in your organization will be part of a great story, one in which you'll all live happily ever after. ■

"Universities are triumphant testimony that technologies rarely simply supplant one another. What distinguishes a great institution is the wisdom with which its faculty members choose among the tools available to them, to find the ones best suited to the tasks at hand."

James J. O'Donnell
"Tools for Teaching: Personal Encounters in Cyberspace"
The Chronicle of Higher Education
February 13, 1998

In Future Issues

- *Linking campus strategic planning to information technology planning*
- *What, if anything, IT has to do with institutional quality*
- *Helping the faculty to incorporate IT into the curriculum*

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EDUTECH RESPONDS

Q. We are about to begin implementing a new campus information system and have noticed that many of our support staff seem very resistant to making this change. They've grown very comfortable in their old ways, and others of us are getting increasingly concerned that these staff members will inadvertently sabotage the process.

A. *There are a number of ways to handle this, and the sooner you begin, the better. The resistance that support staff often have to a new system comes from the same root as a faculty's member's resistance to using technology in the classroom—it's all about risk. How much risk are you asking each person to take? Are you preparing them and supporting them to take that risk in a reasonable way? A support staff person could well be worried that she or he will be expected to be productive on the new system right away without enough—or even any—training. Support staff are also often concerned about losing the "personal touch" with students and others that they interact with daily, something that they value very highly and don't want to risk losing. Reassuring them that there will be all the training they need and that a new information system could actually enhance their personal interaction with students will go a long way to overcoming this resistance. But this assurance has to be genuine, not just words, and you have to be able to demonstrate the benefits of the new system to them—and to everyone on campus—in ways that are meaningful.*

Q. Our computer center folks sometimes seem as if they are operating at the extreme end of common sense. On the other hand, our faculty can sometimes be overly demanding and quite unreasonable. I know this is the case on a lot of campuses. Is there a way to get these two sides to work together better?

A. *You could begin by not thinking about "sides," a word that implies conflict or competition. Certainly both groups have different perspectives on almost any issue or situation, but they both have very important roles to play in how—or whether—information technology reaches its potential on your campus. Dialogue, discussion, clarity of mission, and deep understanding of each of their roles is necessary, much of which can be achieved through direction from the top administration and an active faculty IT advisory committee.*

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The Staff Crisis

by Barbara Horgan, Butler University

People, money, politics. No, I'm not talking about Washington, D.C. These three topics were the key issues for CIOs two years in a row at the CIO Constituent Group Meeting at the CAUSE (www.cause.org) annual conference. This year, though, people—or staff issues—topped the list of concerns: hiring, training, and retaining quality information technology (IT) professionals.

With the year-2000 crisis looming, fewer computer science students graduating, and a booming information economy, information technology managers in higher education aren't the only CIOs suffering. IT directors in colleges and universities, though, also face competition from the higher salaries offered by corporations that lure student workers and prospective and present employees away from academe. The attraction of a more relaxed and flexible atmosphere of employment in a university is often no longer a lure. With increasing demands and flat budgets, staff are asked to do more and work longer hours without more pay. "We're becoming sweat shops," commented one CIO at the CAUSE conference. In a survey of liberal arts colleges last year, reported in a Fall 1997 *CAUSE/EFFECT* article entitled "Forecasting Financial Priorities for Technology," Marty Ringle of Reed College noted that 90 percent of CIOs surveyed felt that demands were rising more rapidly than staff size, despite a 41-percent increase in salary expenditures from 1989 to 1995. During that same time, half of the schools reported reduced staff longevity.

Thus, in addition to the "support crisis" of the past few years, the staff crisis has been added as a key challenge for information technology administrators. Just as with the support crisis, no

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"Computers are threatening because they force us to reconceive the role of the classroom teacher. In the past the authority flowed from the fact that the teacher was the source of valuable knowledge and information. In our emerging knowledge society, however, information is cheap and readily available. The precious commodity becomes knowing how to access information, and the teacher gains authority as expert learner. Using the new technologies to play the role of model learner ... is an exciting job description."

Edward Fiske
"Computers at the Crossroads"
Technos
Spring 1998

NEWSBRIEFS

TWO CALLS FOR PROPOSALS

"Learning On Line '98: Building the Virtual University," sponsored by Virginia Tech and the Center for Organizational & Technological Advancement, will be held June 18–21 in Roanoke, Virginia. Conference organizers hope to launch a serious, sustained, and on-going debate about the virtual university and are looking for one- to two-page proposals for papers and presentations exploring the theory and methods of university and college-level teaching and learning in the digital environment. Proposals are welcomed on such topics as student success in the virtual university; the faculty and digital discourse; faculty workloads, job control, and rewards; and building, maintaining, and upgrading virtual university infrastructures. The deadline for proposals is April 1. For more information, see http://ebbs.english.vt.edu/Learning-98.

The CAUSE98 conference, "The Networked Academy," to be held December 8–11 in Seattle, is also looking for proposals. The conference tracks include: distributed computing and networking technologies; applications development in the age of the Web; changing organizational structures and information professional roles: staff development and training to meet the needs of a distributed environment; curriculum support in the networked academy; providing support in a networked environment; information architectures, standards, and policies; and achieving results through business process reengineering and work process simplification. The preferred method of submitting a conference presentation proposal is through the CAUSE Web server at http://www.cause.org/conference/c98/cfp.html or e-mail submissions can be made to cfp@cause.org. The deadline is April 13.

PAUL EVAN PETERS AWARD NOMINATIONS

The Paul Evan Peters Award Program, endowed by Educom, the Association of Research Libraries, CAUSE, and Xerox, serves to recognize notable and lasting achievements in the creation and use of information resources and services that advance scholarship and intellectual productivity through current and future networked information technologies. To be considered for an award, an individual must meet one or more of the following criteria: demonstrated a positive and lasting impact on scholarly communications through the implementation and/or use of advanced networked information technologies; addressed a specific problem fundamental to scholarship, research, and intellectual productivity and provided an innovative solution using advanced networked information technologies; helped increase awareness of the role of scholarly information and communication through dissemination of effective techniques in networked environments; and made a career-long contribution to the advancement of scholarly information and communications through the implementation and/or use of advanced networked information technologies.

The deadline for nominations is May 1. For more information and to submit a nomination, see http://educom.edu/ppawards/index.html.

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The Staff Crisis...

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magic bullet or quick fix is apparent. Several strategies, however, can be used to mitigate each aspect of the problem: hiring, training—or keeping staff current—and retaining employees. While hiring difficulties have received the greatest press, with appropriate training and good retention, recruitment becomes less of an issue.

How can we fill all our vacant technical positions? Creativity is important nowadays to attract technical staff who are being lured by the signing bonuses, stock options, and high salaries in industry. A Northern Arizona University brochure advertising several open positions and touting the virtues of location and lifestyle circulated at the CAUSE97 conference.

An alternative to national advertising is to hire younger and/or less technically qualified staff locally, and then train them for your environment. A variant of that approach is recruiting one or two technical stars, who can then train others, a strategy found effective by Frank Sirianni of St. John's University in New York City.

Rather than always looking outside the institution, you might also consider looking within. Other employees at the university or college who make much less than information technology staff may be attracted to open IT positions. At Seattle University, we hired new staff for our administrative systems project from other departments. They already knew the university and saw the chance to work in information technology as a great career move with both training opportunities and a salary increase.

Outsourcing has become popular in industry as a way to save money and add value. It's also an obvious choice for filling technical gaps, providing non-core services or filling needs for short-term, well-defined projects, especially in areas with a shortage of qualified IT personnel. There are drawbacks in terms of loss of control and divided loyalties, but if deliverables are clearly established and the contract is managed closely, results can be sometimes superior to in-house staffing.

> *With the rapid pace of technological change, training and professional development are issues for all information technology professionals, from the CIO on down.*

Even though finding good staff is as hard for agencies as it is for universities, technical professionals sometimes see temporary work as an opportunity to get more exposure to different types of technology. We were successful at Seattle University in hiring a temporary Unix administrator when we couldn't find a permanent one. Not only was the position filled well, but being used to a more rigorous business approach of change and process management, he was able to document procedures, modifications and policies, making it easier for the permanent employee we eventually hired to understand our environment.

Another strategy for hiring that's in-between outsourcing and bringing on full-time permanent employees is to contract with technical staff for a short time period (two to three years). In "Is Strategic Planning for Technology an Oxymoron?," a paper give at the 1997 CAUSE conference, Marty Ringle and Dan Updegrove describe these "closed-end contracts" as a way of managing turnover so that it has more predictability. The other advantage is that, with constant change in technology, this approach allows modifying positions to suit present needs more easily.

A related way of expanding staff without worrying about recruiting full-time personnel is to use a pool of money to fund hourly workers as needed for projects. Again, this strategy permits flexibility and responsiveness to changing technological needs.

Another way to address the shortage is to redeploy staff from areas of declining need, such as computer operations, to work in more critical ones, such as network operations or user support.

Distributed support is also a strategy to meet increasing needs for user services staff. Instead of funding all positions centrally, encouraging departments to hire and train their own support staff may enable them to acquire staff more responsive to their needs. Linking these formal and informal distributed technical support personnel to the central help desk and to training offered to central IT staff helps assure quality and consistency.

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Barbara Horgan is Executive Director for Information Resources at Butler University.

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Building the Faculty Support Pyramid

Help! I Need Somebody Help! Not Just Anybody.

Your campus has been fortunate. Over the past few years, you have been able to find the funding to put a computer on every faculty member's desk, to wire the faculty offices, and most recently to extend the network to the residence halls. Even those faculty who everybody assumed would languish until Jubilee Day in computer darkness are busy sending e-mail, calling up the library catalog on-line, and in some cases peppering their personal Web pages with witty commentaries that will only be fully appreciated by a few people within their specialty.

Your Technology Steering Committee is quite pleased with the results of their efforts. But they are ready to move the campus forward another step. After all, the purpose of all this technology effort has always been at heart an educational one. Momentum is building on your campus for a serious effort to make the presence of information technology felt within the curriculum and in the classroom.

There has been talk of various measures the campus could take: asking each department to develop a plan for making the best use of technology within their discipline, offering small grants to individuals for pilot teaching projects, perhaps even adding new courses or enhancing existing ones. But one thing is clear to everybody—if the faculty are really to make a serious effort at technology-based curricular change, they will need substantial support.

That support goes far beyond the traditional help desk or a computer technician who can reinstall Windows. Faculty, who occupy a key place at the top of the pyramid (the instructional program), will need a wide base of massive supports to keep the whole structure from wobbling.

That base involves a range of skills that will probably need to come from a variety of sources. There will be roles for information services technical staff and management, library and media staff, faculty volunteers, student consultants, vendors, and outside practitioners. Some of the support will also come from professional organizations, meetings, conferences, online resources, and printed materials.

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Here are categories to consider as you plan the base of support:

Technical Support:
Set it up, make it work ———
Possible sources: Information Services, Media Services, outside contractors.

Are there enough technicians on staff to support the new teaching facilities you are going to add and the increased use of existing facilities? Note that with the increased emphasis on IT in courses, a failure of technology can stop a class or a course cold. As faculty use more applications and more complex applications on their desktops, the difficulty of installing, upgrading, and maintaining them will only increase.

The network will require round-the-clock support, especially as it becomes used in the student residences. Support for the network will become more critical as the communications and Internet environments become essential parts of the curriculum and of academic life in general. Technical resources will be especially strained during the rollouts and at the beginning of the term. Outsourced technical services may be a helpful supplement during these times, but it will be important to test their quality beforehand if possible, and to have a clear roadmap so you can spot when resources are not going to be sufficient.

How-To Support:
Using applications ———
Possible sources: Information Services, faculty peer trainers, outside specialists.

Valuable startup support can sometimes be provided by taking advantage of the enthusiasm of early adopters among the faculty, who are often eager to help their colleagues get started. But long-term support will have to be provided as well, and the demand will increase as more faculty enter the ranks as participants.

The Information Services department probably now has a formal responsibility for providing workshops, but it is necessary to assess whether those currently responsible for the training have suitable teaching skills. Excellent technicians do not always make good teachers. Students can turn out to be very good teachers, but a student-based training program needs thoughtful management and oversight.

Those providing this type of assistance to faculty will find themselves with a wider and wider array of specialized applications to support, some of them requiring familiarity with a discipline. Vendor or consultant support may be required for some specialized software and may need to be budgeted for.

Help for Students:
Assistance in labs and dorms —
Possible sources: Information Services, student consultants

Even if faculty do the initial training for students in their courses, the students will need help with problems during the evenings and on weekends. The labs they work in will need to be staffed. The supervision of student consultants will require an increasing level of technical ability, which may overwhelm a person who has been supervising the students successfully for a long time. Student teaching assistants can also be very valuable in aiding an instructor during hands-on classes.

General Instructional Support:
Help faculty make academic use of general software ———
Possible sources: Outside faculty practitioners, faculty peer trainers, instructional coordinator.

There are many powerful kinds of software that, although they are not specifically educational in purpose, allow for creating new approaches to teaching and new environments for learning. For instance, e-mail, chat groups, groupware, conferencing, and hypertext can allow creating interactive and collaborative settings. How to incorporate such tools into a course is best learned from practitioners in the discipline. This is about deep changes to the role of the teacher and the students as much as it is about how to use a particular software package.

Faculty often point out that their task becomes much easier if they can depend on priorities to remain stable, standards to be defined and maintained, and system environments to be preserved. This takes effort on the part of the college administration and IT management.

Discipline-Specific Instructional Support:
Help faculty with IT resources specific to a particular field —
Possible sources: Faculty peer trainers, Library reader services staff, outside practitioners, outside resources.

Many faculty express discomfort these days that they are not familiar enough with what is "out there" in their field and want help remedying this. Although it is sensible to look to others for help to avoid reinventing the wheel, ultimately individual faculty members must become their own experts, since knowledge of the discipline is essential to evaluating the usefulness of materials. Faculty peer trainers and Library reader services staff can play an important role is pointing the faculty to the resources, both on-line and in print, that will help them research materials in their areas. The hardest issue is not just identifying materials in a particular discipline, but conceptualizing a role for IT in the teaching of that discipline. Conferences, professional associations, and printed and on-line writings will be helpful in doing that.

Leadership and Planning:
Ensure the continuity of systems and programs ———
Possible sources: College administration, IT management, planning and steering committees.

Faculty often point out that their task becomes much easier if they can depend on priorities to remain stable, standards to be defined and maintained, and system environments to be preserved. This requires efforts on the part of the college administration and IT management to implement a robust planning process and to manage change effectively. This is not often listed as a category of "support," but it may be one of the most important.

You can tell your information technology planning committee that, even though the grass has started to grow back over the last of the conduit trenches, their importance in providing logistical support to the curriculum is going to continue for a long time to come. ■

The Staff Crisis...

continued from page 3

How can we keep staff skills current?

With the rapid pace of technological change, training and professional development are issues for all information technology professionals, from the CIO on down. Technical currency is important in a variety of ways. First, it is critical to success in information technology projects to have the best tools and expertise. Also, training is an important strategy in retention since many technical staff are motivated by learning new skills and tools.

Despite the importance of professional development, money for it is often the first to be cut when budgets are tight. According to the Gartner Group (www.gartner.com), corporations often spend as much as ten percent of IT budgets on training. In higher education, allocating even a more modest amount or percentage (at least three to four percent) to each staff member annually for professional development can ensure that ongoing training gets the attention it deserves.

In addition, providing regular time off for employees to learn new software and skills is another strategy for training that also can aid in retaining staff. Keeping up one's technical skills can be a powerful motivator for an IT staff member.

Rotating staff and/or cross-training are other methods for assuring that staff are learning. These strategies also help provide backup for key areas. In small IT organizations, losing a critical staff member, without any backup, can cripple the department. Even in departments with larger staffs, rotation and cross-training promote new knowledge and introduce variety that can combat burnout. Assigning a mentor to each new staff member promotes cross-training and allows a faster learning curve in both technical and team skills.

How can you keep them down on the farm...?

Next to hiring, retaining good staff is the greatest challenge. If universities can't compete on salary and access to the latest technology, what can CIOs and other managers offer staff as inducement to come and to stay? Conventional wisdom is that staff are not primarily motivated by money. If that is true, IT managers need to understand what does motivate: recognition, reward, opportunities for advancement, an ability to grow and learn on the job. All of these motivators are easier to provide than large salaries.

> *We need to understand what motivates technical staff: recognition, reward, opportunities for advancement, an ability to grow and learn on the job. All of these motivators are easier to provide than large salaries.*

Giving staff opportunities to get away from the job occasionally is one way of increasing satisfaction and decreasing burnout. This time off can be a day or two once a month where staff members don't have to answer the phones, troubleshoot problems and deal with users. Instead, they can learn new software, work on long-term projects, and catch up on professional reading.

Longer unpaid leaves are another way of giving time off: letting staff go for a month or two when they are suffering from overload. Setting aside time each day away from phones and user demands alleviates stress and increases productivity, which is important to a sense of accomplishment. Even encouraging—or at least not preventing—staff from taking on consulting opportunities can promote retention when staff want to stay but are looking for additional money which you can't provide.

Reward and recognition need to be part of every day's business as well as regular staff meetings. IT staff are often overwhelmed by user complaints and never-ending projects. Information technology managers must see as a key function of their jobs encouraging, empowering, and appreciating their employees. Although this advice sounds obvious, it's less common in practice than it should be.

Individual and team successes must be regularly acknowledged and celebrated. Two books that are essential reading for IT managers interested in retaining staff are: *1001 Ways to Reward Employees* by Bob Nelson (Workman Publishing, New York, 1994) and *Managing to have Fun* by Matt Weinstein (Simon and Schuster, New York, 1996). When the workplace is enjoyable and people feel appreciated for their work, staff are less likely to look elsewhere.

Technical professionals are also motivated by challenge so that giving top performers new projects and new technologies to work with is an excellent retention strategy. And for those that are interested in

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developing management skills, supervising students can be a first step in the process of moving up the career ladder.

Developing career paths for technical professionals besides just moving into management positions is also important. Working with Human Resources departments, IT managers can implement classification schemes to facilitate promotion, even within the same job type, by establishing different levels of expertise, for example. Broad banding classification schemes are more amenable to this type of tiering. However it is accomplished, establishing technical, non-managerial career paths is critical to providing opportunities for promotion and recognition for superior performance, even in smaller colleges.

Conclusions

The staff crisis has become perhaps the greatest challenge facing higher education information technology administrators and managers today. The problem results from a shortage of qualified technical professionals at the same time as the demand for them is increasing, insufficient training and professional development, and limitations on salary and promotions.

Although few easy solutions exist, flexibility in recruiting and organizing staff, providing training opportunities and other time away from user demands, and consistent attention to rewards, recognition, and growth help in building and keeping a strong information technology staff. ■

"I have a feeling of deja vu all over again when I observe current enthusiasm for newer versions of the electronic university. I may exaggerate. But the new dedication to computer-assisted learning strikes me as something akin to a crass religious cult: Give the digital revolution an educated home and America will surely blast the competition in the global marketplace! When the millennium arrives, American students will no longer play 13th fiddle to the high test scores of those students in Singapore! On second thought, it is not so much analogous to a religious faith as it is similar to an island cargo-cult or piece of medicine show quackery. Idolatrous faith that computers will save Western civilization threatens to become the conventional wisdom. It is hard to find a politician who is less than enthusiastic about wiring up the nation and providing a computer for every student at all levels, including the digitally-deprived of the inner city."

Thomas H. Thompson
University of Northern Iowa
"3 Futures of the Electronic University"
Educom Review
March/April 1998

In Future Issues

- *Linking campus strategic planning to information technology planning*
- *What, if anything, IT has to do with institutional quality*
- *Helping the faculty to incorporate IT into the curriculum*

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EDUTECH RESPONDS

Q. We are nearing completion of our new administrative information system implementation. All of the offices will be up and running within two months. But the users are already grumbling about things they want to do and can't. After all this work, we in the computer center need to turn our attention to other things now, and we had hoped that with a successful implementation, we could. How do we resolve this without alienating our users?

A. *Congratulations on a successful implementation, but your expectation that you can now switch gears is probably unrealistic. It sounds like it's not too early to begin thinking about and planning for a "Phase II." This is usually the phase during which the "administrative" information system turns into a "campus" information system. Phase II would include such things as full deployment of the system to all administrative offices, to all faculty, and to all students. It would also include eliminating shadow systems by making information timely and widely accessible (such as budgets), reducing the paper flow throughout the institution, and creating true efficiencies by cutting down on the labor-intensive nature of administrative work.*

Q. Our IT staff size has grown very quickly over the years, as has the demand for our services. We're a great group, but it's becoming clear that we need a set of basic guidelines to change from a "Mom-and-Pop" operation to a more formal and professional service group. Can you suggest some?

A. *There are "commonly accepted IT practices" that would be useful to institute. Examples include doing both a formal self-assessment and user surveys on a regular basis and communicating with the community as appropriate; reviewing tasks done by IT and deciding which ones can be delegated to outside services, automated, or omitted; creating a process for tracking both problems and requests, assigning priorities based on written policies and the work of committees, and keeping users informed regularly of the status of their requests; establishing a real Help Desk; establishing individual learning plans for each IT staff member; developing service level agreements with each major user group that match user expectations with the department's resources and capabilities; and establishing a comprehensive, proactive program for helping users to learn how to use all available software.*

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